

Norovirus Gastroenteritis
2006 - February 2007
Eaton County



**As Presented at the 2007 Michigan
Communicable Disease Conference**

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Norovirus Gastroenteritis 2006 - February 2007 Eaton County

Barry-Eaton District Health Department
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Caring for the Community
since the 1930's

I am presenting the experience in Eaton county with norovirus gastroenteritis in 2006 and early 2007.

My assumptions are that the audience has experience with norovirus outbreaks and the resources available from the state. Links to the resources follow the references at the this slide set.

Overview

- Relevant literature
- Case studies
- Observations
- Goal: Reduce morbidity

So since we all have experience with norovirus outbreaks, I have elected to begin by reviewing some literature that I think is relevant to norovirus outbreaks.

I will present some case examples where perhaps the interventions limited or prevented an outbreak.

I will also provide some observations related to other aspects of our outbreak.

The goal is to reduce the number of residents infected with norovirus. I hope that you might find some of our experiences useful in your jurisdictions.

Acute Gastroenteritis (GE)

- Syndrome of vomiting, diarrhea, or both, that begins abruptly in otherwise healthy persons and is most often self limited¹

First: Basic definition

Acute gastroenteritis is a syndrome of vomiting, diarrhea, or both. It begins abruptly in otherwise healthy individuals and is most often self limited.

Acute Gastroenteritis is Viral; Viral GE is NV

- Bacterial acute gastroenteritis in developed countries is infrequent. Prospective studies of acute GE identified salmonella, shigella, campylobacter and E. Coli 0157:H7 each in 2% or less of fecal samples¹
- US: Norovirus causes >90% of outbreaks of GE¹

Acute gastroenteritis is viral. Bacterial acute gastroenteritis in developed countries is infrequent.. Prospective studies identified salmonella, shigella, campylobacter and E. Coli 0157:H7 each in 2% or less of fecal samples

In the US, novovirus is responsible for >90% of outbreaks of acute gastroenteritis.

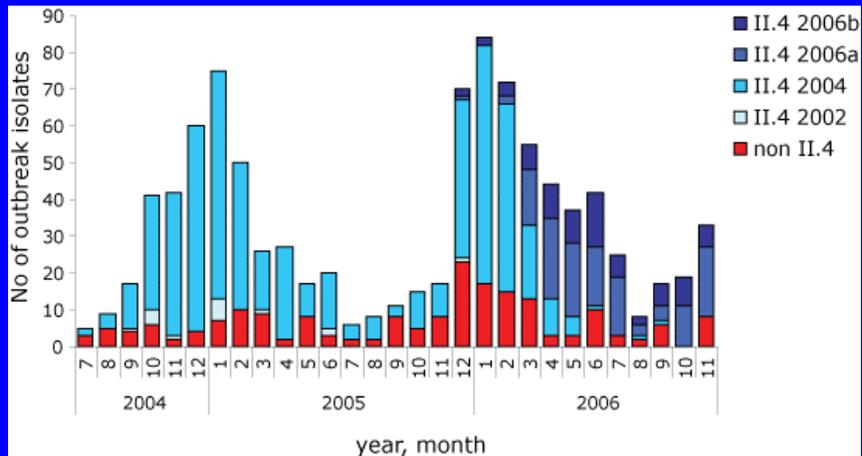
4 NV Pandemics in Last 10 years

- 4 pandemics associated with new variants of GGII.4
 - 1996
 - 2002
 - 2004
 - 2006

Eurosurveillance 2006;11(12):061214

Norovirus gastroenteritis occurs in pandemics. There have been 4 pandemics in the last 10 years associated with new variants of genogroup GII 4.

Genotypes/variants in seasons 2004/5, 2005/6 and the start of 2006/7- FBVE network



This slide displays the genotypes and variants from 2004 through November 2006. This is from the Foodborne Viruses in Europe Network. The number of outbreak isolates is on the Y axis. Notice that the Geotype II4 2002 and 2004 variants have been replaced with not one, but two new variants, 2006a and 2006b this year.

In December 2006 the Foodborne Viruses in Europe Network, a group of 13 countries, surveyed their members. 9 of 11 respondents reported an increase in norovirus activity in October and November. As a result, the FBVE recommended to hospitals and nursing homes to educate their staff about the possibility of norovirus outbreaks and to provide information on clinical presentation. They also recommended consulting their outbreak protocols and strengthening preventive measures in preparation for the present outbreak season.

Passive Surveillance

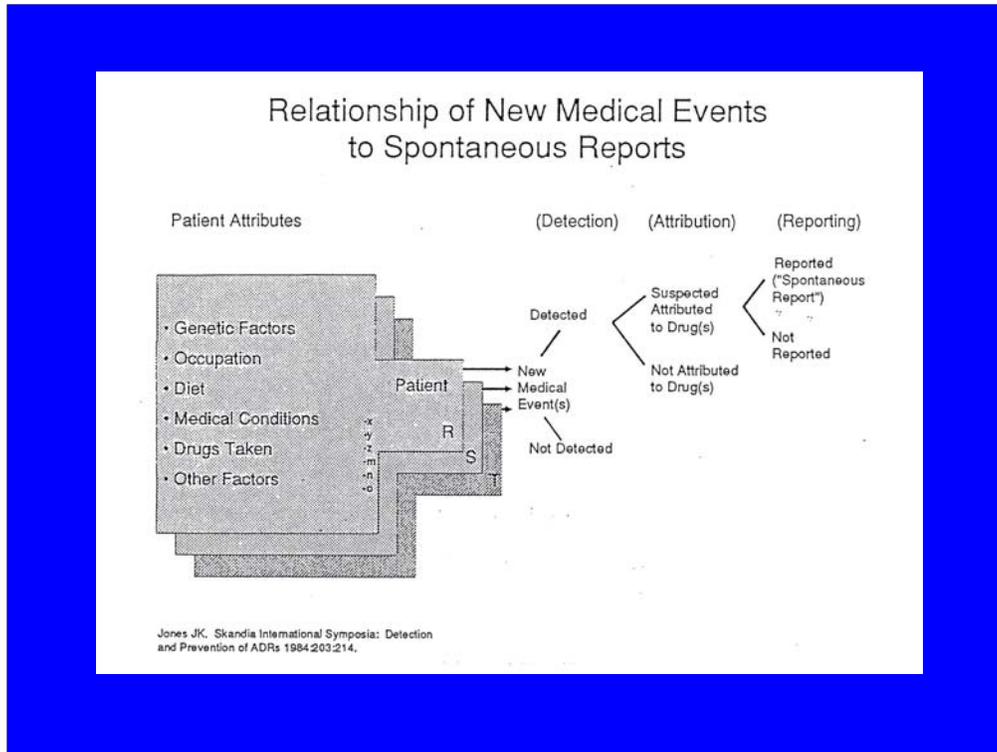
- Surveillance: Systematic ongoing collection, analysis, and dissemination of information for use to reduce morbidity and mortality and improve health
- Three steps in collection: Detection, attribution, and reporting
- Under-reporting occurs

At the local level, we rely on passive surveillance to detect cases of norovirus gastroenteritis.

To review, surveillance is the ongoing collection, analysis, and dissemination of information for use to reduce morbidity and mortality and to improve health.

There are three steps in the process of collection: detection, attribution, and reporting.

At each step, a certain number of cases drop out of the process. The result is that there is under reporting of cases. We only receive the tip of the iceberg.



To understand underreporting, we need to review relationship of a new medical event to reporting to passive surveillance systems.

This model is from post marketing adverse drug reaction monitoring. We called the passive reports “spontaneous reports”. But this model applies to all passive surveillance or spontaneous reporting systems.

This model was provided by Dr. Judith Jones of the Degge Group and Georgetown University.

We begin with the unit of analysis which is the patient. Patients have unique attributes-genetic factors, occupations diet, medical conditions, drugs and other factors. Norovirus is introduced into this mix. Three things can happen. First some folks exposed to NV are not infected (about 20%). Second, others are infected but asymptomatic (about 25%). The infected asymptomatic who are workers are a problem for me. Are they contagious and should they be kept off work? The third thing that can happen is symptomatic infection (55%). So, when you have an attack rate of 50%, that means that everyone was exposed.

Of the people who have events or symptoms, some have predominant vomiting, some abruptly and some with warning. Other have predominant diarrhea.

So the patient has a medical event or symptoms. Does he attribute it to an infection? One of our NV PCR positive employees attributed his diarrhea was due to a flare of his lactose intolerance. Another blamed a hangover.

If the symptoms is attributed to infection, do they attribute it to a contagious infection?

Do they report their contagious disease? To whom? Their employer? The restaurant?

And if it is reported to the surveillance system, how is it followed up? Do you actively investigate all potential exposures in the last 24-48 hours. Or is the system passive and you wait for the next report associated with that facility to come in?

NV GE is Common

310,000* - 2,800,000+ cases in Michigan

MI pop 10 mil

* 0.28 cases GE/person/yr; 11% NV (cohort study Netherlands)¹⁵

+ 0.79 cases GE/person/yr; 35% NV (questionnaire survey US)¹

Acute norovirus gastroenteritis is common.

The population of Michigan is 10 million. I played with some numbers and estimate that there are between 310,00 and 2.8 million cases of norovirus gastroenteritis each year in Michigan.

NV GE is Under-reported

- Magnitude of under-reporting:
 - 60 - 540 cases : 1 report*

*Est 0.31-2.8 mil NV case per yr/ 5151 NV cases reported in 2006

But Norovirus gastroenteritis is under-reported to surveillance systems.

In Michigan, even though we received over 5000 cases in 2006, that means that there are between 60 to 540 cases in the community for each one reported to our state surveillance system.

This magnitude of underreporting is not out of line with other examples. A population based community cohort incidence study in the UK involved 9776 patients. They also conducted a general practice incidence study involving 70 practices and 459,975 patients. They linked cases in the community and in general practice to reports to the national surveillance system

The numbers underrepresented outbreaks because they excluded congregate settings such as long-term hospitals, prisons, universities and residential homes.

So in the UK they found that for every 139 cases of acute gastroenteritis in the community, 33 saw a doctor and one was reported to the national surveillance system.

For norovirus, the reporting rate was 1562 cases in the community for each one at the reporting center. The confidence intervals are quite wide because of the small numbers of reports to the reporting center.

In postmarketing adverse drug reaction monitoring, it is estimated that only 1% of ADRs resulting in death or hospitalization are reported. For nonserious events, particularly those not requiring physicians attention, underreporting is greater by at least one order of magnitude.

Eaton NV Outbreak Experience 2006 - Feb 2007

- Sites
 - 4 Food service establishments
 - 2/3 Skilled nursing facilities
 - 1 Retirement center
- Dates
 - Jan 06 - 1; April 06 - 1; Nov 06 - Feb 07 - 6
- Location: West Lansing

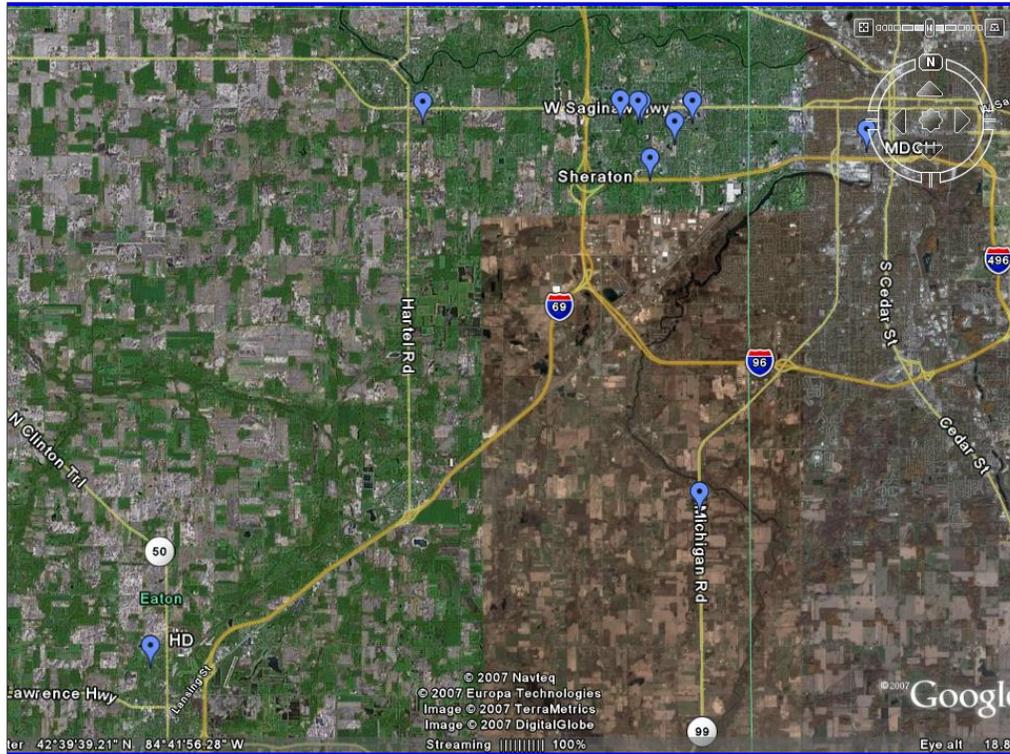
This slide summarizes the Eaton experience with norovirus gastroenteritis in 2006 through February 2007.

We had 7 sites associated with norovirus outbreaks. There were 4 food service establishments. We have 3 skilled nursing facilities in the county and two had outbreaks. One skilled nursing facilities had three outbreaks that we know of. One retirement center had an outbreak.

Single outbreaks occurred in January and April of 2006, and 6 outbreaks occurred between Thanksgiving 2006 and the first week in February 2007

The January outbreak was different because norovirus genogroup GI/4 Chiba was identified. It was also a large outbreak and that experience influenced the health department's subsequent responses and activities.

Over 1000 patrons or residents and over 90 employees were identified with GI complaints in these outbreaks. The majority do not reside in Eaton County.



This slide shows the location of the outbreaks. First for orientation, Lansing is in the upper right corner. The county line between Eaton and Ingham County is the vertical green line. The county line between Eaton and Clinton Counties is the horizontal green line..

A couple of landmarks. This is the location for the Michigan Department of Community Health (far upper right). This is the location of the Eaton Health Department. This is the Sheraton, which is where this conference will be next week.

There was one outbreak to the west in Grand Ledge, and one in Dimondale to the South. The other sites of norovirus gastroenteritis were on West Saginaw.

There are 2 small hospitals in Eaton county in Charlotte and Eaton Rapids. However most transfers to the nursing homes are from the large Lansing hospitals in Ingham county.

Diagnosis of NV GE is Clinical

- Sudden onset of vomiting, or diarrhea, or both
- The patient is one of several people affected by the same illness
- “Not norovirus”
 - High fever, bloody diarrhea, severe abdominal pain, more than 6 stools/24 hours
 - Travel, antibiotic use, sporadic hospital-acquired diarrhea⁴

The diagnosis of norovirus as the cause of gastroenteritis is made clinically.

You are in your office and has received a report of a patient with gastroenteritis, the sudden onset of vomiting, diarrhea, or both.

What is the cause of the gastroenteritis?

Norovirus is likely if the patient is one of several people affected by the same illness.

And norovirus is likely if the patient does not have “not norovirus”. These “not norovirus” findings are high fever, bloody diarrhea, severe abdominal pain, or more than 6 stools in 24 hours. Other items to exclude include recent travel, recent antibiotic use, and sporadic hospital-acquired diarrhea. If someone has “not norovirus” symptoms, then you need to consider stool samples or additional testing.

Stool Samples Not Needed for Diagnosis

- Kaplan⁵
 - Vomiting (often projectile) >50%
 - Incubation 24-48 h
 - Duration 12-60h
 - Stools negative for bacterial and parasitic pathogens
- Chadwick⁶
 - Vomiting (often projectile) >50%
 - Incubation 15-48h
 - Duration 12-60h
 - Staff and patients/patrons affected

Stool samples are not needed for the epidemiologic diagnosis of a norovirus outbreak. The epidemiological criteria for a norovirus outbreak that we are familiar with are the Kaplan Criteria. However, the Kaplan criteria requires stool microbiology.

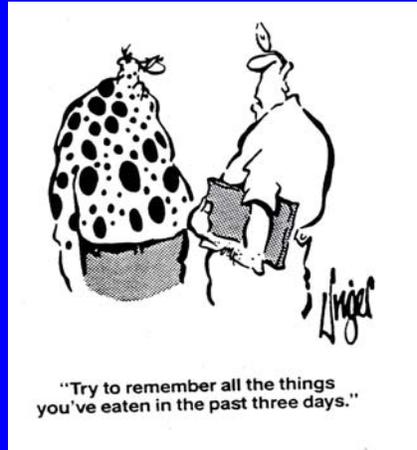
The Chadwick criteria are similar except stool cultures are not required. Vomiting is present in more than 50% of ill, the incubation period is 15 h to 48 hours. In our experience, 32 hours is the magic number-you can almost set your clock. The duration of symptoms is up to 2.5 days. But importantly, staff and patients/patrons are infected.

In our outbreak experience, illness in both staff and residents or patrons was always present. In food service establishments there was illness in the staff before the development in illness in the patrons. In the hospitals and nursing homes, the illness begins in staff and residents on the same day.

The specificity of the Kaplan criteria is 99%, meaning that if the criteria are present, then 99% of the time it is NV. The sensitivity is less (68%) meaning that of confirmed norovirus outbreaks, 68% fulfilled Kaplan criteria. (Turcios RM Clin Infect Dis 2006;42:964-9)

Crucial History

- Where you have been?
- Who have you have been with?



This is a cartoon about the 72-hour food history. The caption is "Try to remember all the things you've eaten the past three days."

The crucial history in acute norovirus gastroenteritis is where you were 32 hours ago and who you were with. Our procedure now is to followup a complaint by checking were they were 32 hours ago and asking about GI illness in the staff.

I said that food is not important. That is not always true. Eating raw oysters is important history. But 72 hour food history is not high on our priority list.

Person to Person Transmission

- Person to person
 - Aerosolized droplets
 - Environmental surfaces
 - Food is an environmental surface

Norovirus is transmitted person to person. Transmission can be directly or via aerosol or environmental surfaces.

It helps me to think of food as an environmental surface and not as the primary source of the virus.

Consumption of contaminated food or water causes large outbreaks. However, although most foodborne illness is norovirus, most norovirus disease is not due to foodborne transmission

Generation of aerosols

- Toilet flushing causes splashing or aerosol generation. Spreads virus to contact surfaces such as the toilet seat or flush handle¹²
- Vomiting gives rise to infectious aerosols that may remain suspended for significant periods of time¹¹
- Aerosol particles settle onto contact surfaces which are then touched by the hands¹²

This is how aerosols are generated.

Toilet flushing causes splashing or aerosol generation. This spreads virus to contact surfaces such as the toilet seat or flush handle.

Vomiting gives rise to infectious aerosols that may remain suspended for significant periods of time.

Aerosol particles settle onto contact surfaces which are then touched by the hands.

Fingers Both Acquire and Transmit NV When Contact with Environmental Surface

- Contaminated fingers can transfer norovirus up to 7 clean surfaces touched sequentially¹²
- Wipe NV contaminated surface with detergent soaked cloth and then wipe a second surface
 - NV recovered from the second surface and the hands of the person handling the cloth¹²

When the hands contact norovirus, they both acquire and transmit Norovirus.

Contaminated fingers can able to transfer norovirus up to 7 clean surfaces touched sequentially.

In the same study, a norovirus contaminated surface was wiped with at detergent soaked cloth and then the cloth was used to wipe a second surface. Norovirus was recovered from the second surface as well as the hands of the person handling the cloth.

In one study, 14 people could be contaminated one after the other by touching a contaminated door handle³

Management of NV Outbreak

- Manage individuals-isolate contagious, quarantine exposed, restrict susceptible, cohort employees
 - Closing units to new admissions w/in 4 d of onset reduces length of outbreak from 15 d to 8 d (p=0.002)*
- Decontaminate the environment
- Hand washing

*Emerg Infect Dis 2004;10:1827

For all of us involved in trying to control outbreaks of gastroenteritis, these control measures are very familiar.

First we have to manage individuals: Isolate the contagious, quarantine the exposed, restrict the susceptibles, and cohort employees.

Outbreaks were contained faster (7.9 vs 15.4 days, p=0.002) when units were rapidly closed to new admissions (<4days) (Lopman BA. Epidemiology and costs of NV GE, Avon, England, 2002-2003 Emerg Infect Dis 2004;10:1827). This is due to restricting susceptibles.

Decontamination is all about following the guidelines for environmental cleanup

And we always emphasize hand washing. But there are limitations to hand washing.

Hand Washing

- “Hand washing alone is unlikely to be effective if recontamination occurs via environmental fomites”¹²
- “It is impossible to be sure that hand hygiene eliminates the virus from the hands of symptomatic persons”¹³

First, handwashing alone is not effective if the environment is contaminated.

Second, it is impossible to be sure that handwashing eliminates the virus from the hands of symptomatic persons.

Vomit is Bad

- NV is in vomitus and feces; bacteria causing acute GE are shed exclusively in feces¹
- NV infectious dose 10-100 particles⁸
- Vomiting > 30 mil viral particles⁹
 - Public vomiting incident (PVI) doubles attack rate

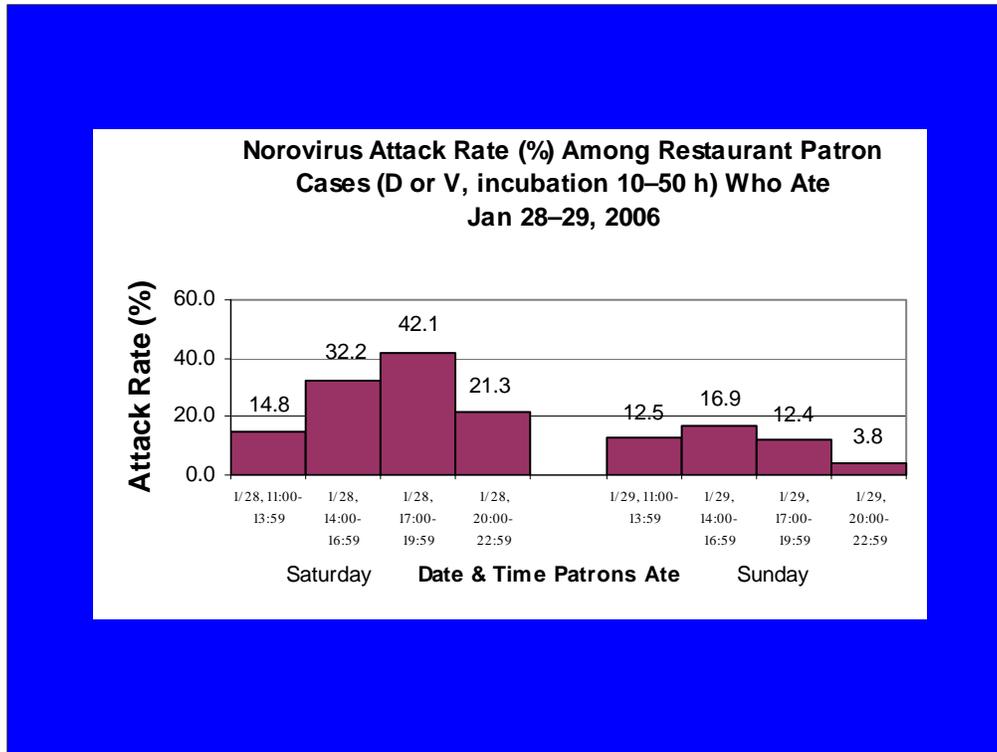
Now for some lessons learned:

First, vomitus is bad.

Vomit is bad because norovirus is present in both vomitus and feces. In comparison, bacteria causing acute gastroenteritis are exclusively in feces.

We know that the infectious dose of norovirus is low and we know that there is lots of norovirus in vomitus and that vomiting aerosolizes norovirus.

The result is that with a public vomiting incident or PVI the attack rate doubles.



In this example, the attack rate is on the Y axis. There are two days on the X axis, Saturday and Sunday, divided into 3 hour blocks. The attack rate is calculated by looking using the number of patrons served in the denominator and the number of patrons who contacted us and reported illness associated with eating in that time frame. So these numbers are an underestimate of the true attack rate.

There was background illness in this facility with about a 15% attack rate associated with exposure from 11 AM to 2PM. At 2PM an employee vomited into a waste basket on the food service line beneath a ceiling exhaust fan. The attack rate doubled. He went home but the attack rate remained high. We suspect that the use of cloths soaked in sanitizers, particularly quaternary ammonium compounds to wipe down tables and countertops, served to spread norovirus throughout the institution and to patrons and employees.

The employee who vomited on Saturday was called into work on Sunday afternoon because they were short staffed. As you see the attack rate continued to decrease even though he was working.

Need a Plan - PVI Food Service Establishment

- Isolate/exclude contagious person
- Decontaminate the environment
 - Disinfect all surfaces within 40 ft radius (depending on airflow)
- Facility closure - partial or full

So facilities need to be prepared to react to gastroenteritis. In the food service establishments they are encouraged to have an emergency action plan to respond to an acute vomiting episode.

The ill person is excluded.

The environment needs to be decontaminated. With vomiting, BEDHD is recommending cleaning all surfaces within 40 feet, depending on ventilation.

The facility may need to be closed to effect cleanup

Case A

- 9 yo vomited outside restaurant bathroom
- Management escorted family from facility, closed the section (hallway to restrooms)
- 2 employees donned gloves and mask, removed visible contamination, disinfected all surfaces within reach, discarded mop heads and cloths in sealed plastic bags
- 2 employees sent home to wash clothes and shower before returning to work
- Management contacted EH for additional advice

Facilities will have plans and follow them. Here is an example.

A 9 year old vomited in the hallway outside a restaurant bathroom. Management escorted the family from the facility, gave them their money back, and closed the hallway to the bathroom

2 employees donned masks and gloves, removed visible contamination and disinfected all surfaces within reach. They discarded mop heads and cloths in sealed plastic bags.

Then because they were not wearing personal protective equipment, they were sent home to wash their clothes and shower before returning to work.

At that point management contacted environmental health for additional advice.

We feel especially good about the last bullet because that means that the establishment sees us as an ally and partner and source of information and not a policeman or regulator.

Need an Outbreak Protocol Healthcare/Retirement Center

- __ Outbreak: Any vomiting staff member, patient, or elder care resident should be considered to have norovirus infection until proven otherwise³
 - By the time the traditional outbreak definition is met (two or more ill ...), the majority of staff and residents will have been exposed, particularly if vomiting is involved⁶

Like food service establishments, health care facilities and congregate facilities like retirement centers need an action plan. The recommendation is that any vomiting staff member, patient, or elder care resident should be considered to have norovirus infection until proven otherwise.

The next three slides illustrate the importance of having an outbreak protocol. These all involve the same skilled nursing facility.

Case B - Skilled Nursing Facility, 1st Outbreak

- Dec 18: 10/18 residents (1E), 1 employee
- Dec 20: Residents: 12/18 (1E), 3/34 (1N), 2 employees
- Dec 21: LHD (EH, CD nurse) onsite visit with DON, ADON, housekeeping, dietary to review prevention. Wound care nurse left with vomiting
- Dec 27: No new illness in 72 hours

On December 18 we received a call about illness and learned that there were 10 of 18 residents on 1 East and one employee with symptoms of acute gastroenteritis. 1East is usually the wing that receives new admissions from hospitals. They need more care and may be a shorter stay than other residents. The nursing facility declined our offer to visit but agreed to keep us informed.

On December 20 we learned that there had been spread to another wing, 1North. So the next day a team of communicable disease and environmental health met with the director of nursing, the assistant director of nursing, housekeeping and dietary to review outbreak management. We emphasized reacting to a single vomiting incident. While we were there, the wound nurse experienced vomiting and was sent home. By December 27 72 hours had passed since last vomiting or diarrhea so restrictions were lifted.

Case B - Skilled Nursing Facility - 2nd Outbreak

- Dec 29: New resident vomited at nurses station (1E) within hrs of admission from hospital. ADON on duty
 - Contact and airborne precautions for ill, quarantined wing, cohorted staff
 - Decontaminate per guidelines
- Jan 2: 4 additional 1 E residents ill, no staff
- Jan 10: No additional ill. No spread to other wings

We were notified that on December 29 a new resident on 1E vomited at the nurses station within hours of admission from the hospital. The assistant director of nursing was on duty. She implemented contact and airborne precautions for the ill resident, quarantined the wing and cohorted the staff.

On January 2 she reported that 4 other residents of 1E became ill. No staff was ill.

On followup Jan 10 there had been no additional ill, no spread to other wings and restrictions had been lifted.

Case B Skilled Nursing Facility - 3rd outbreak

- Mon Feb 12: 1E closed Feb 11
- Feb 16
 - Residents 1E:12/19; 1N 8/34; 1W 4/31; 2N 0/31; 2W 0/31
 - Employees 8
- ADON had left and not been replaced, DON off Feb 10 and 11
- Feb 26 reopened

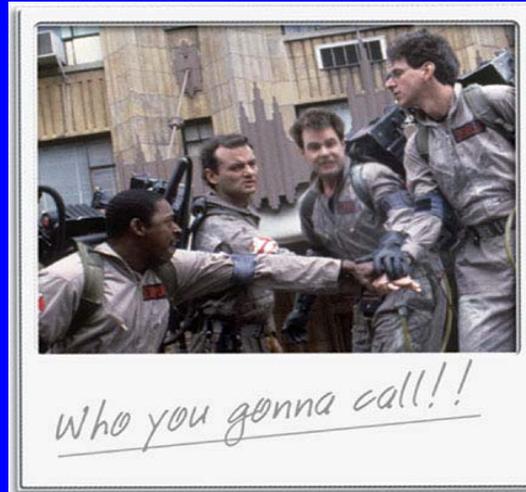
On Monday January 12 we received a call that 1E had been closed on Sunday because of gastroenteritis that weekend.

By February 16 residents on three wings as well as 8 employees were ill.

The dynamics were that the assistant director of nursing had taken a job at a different facility and the director of nursing was off that weekend.

It wasn't until February 26 that 72 hours had passes since the last vomiting or diarrhea had passes and they were able to reopen those wings to new admissions.

Partner and Supervise



We like to go out as a team. We send one or more sanitarians and a communicable disease nurse.

The nurses have skills at obtaining medical histories and isolation procedures. The sanitarians are very good at environmental assessment and remediation.

We have also learned that onsite supervision of management of individuals and the environment is important.

Retirement Center

- Resident contacted LHD (CD) 12/18 re: “flu” outbreak
- Flu symptoms include vomiting and diarrhea
- EH (2), MD inspected 12/18 5P-10P

An anonymous individual contacted the health department and spoke to the communicable disease nurse at about 4PM about a flu outbreak at the retirement center. The CD nurse called the retirement center and spoke with the assistant administrator. She estimated that 30 of the residents had had GI symptoms, and there was also vomiting and diarrhea among the staff. In fact, the administrator was home ill.

I got to go out on this one with 2 sanitarians.

Retirement Center

- 8 wings, 114 apartments, 120 residents
 - Common dining, activity centers, lounge-mailboxes area
 - Not regulated. Requested kitchen inspection by LHD
 - Since 12/12 41 residents/14 staff with GE
- 12/12-12/21 GE in 18 staff and 48/120 residents (2 ER, 5 Hospitalized)
 - NV is not trivial in at risk patients

I learned that this facility had 8 wings, 114 apartments and 120 residents. They shared a common dining area, activity centers, and a lounge mailbox area. This was the popular place to gather.

I also learned that retirement centers are not regulated. The residents are independent

Although not regulated, this facility had requested inspection of the kitchen-to claim in their promotion that they had a health department approved kitchen.

We learned that since January 12, 41 residents and 14 staff had gastroenteritis.

By the time the outbreak ended on December 21, there was gastroenteritis in 18 staff, and 48 of 120 residents. Two residents went to the ER and were sent back to their apartment. Five were hospitalizes. So norovirus is not a trivial condition in at-risk individuals.

2 Sanitarians On-site Supervision

- Manage individuals
 - Quarantine well in apts & cancel activities for 48h
 - Deliver mail to rooms to avoid congregating at mailboxes
 - Cohort food service and other workers
 - Isolate ill in apts
 - Ill employees to return 48h after sx and care for ill residents
 - Change “flu” signage to “V & D”
 - Change gloves and wash hands between apts
 - Instructed on standard, contact and airborne precautions

We have learned that it is important to supervise the control of a norovirus outbreak. The reason is all of the things that the facility needs to do to interrupt the outbreak. So don't look at the specifics on these next two slides. They are presented only to emphasize the number of things we ask them to do.

2 Sanitarians On-site Supervision

- Decontaminate the Environment

- Provided “Guidelines for cleaning ...”
- Increase chlorination in dishwasher to 200 ppm. Wash twice
- Kitchen: Disinfect all reachable surfaces. Dispose all food prepared or touched by employee who returned w/in 72 h
- Eliminate finger foods from staff areas.
- Screen food brought in for residents
- Dining area: Wash linens and bag in plastic. No napkins in glasses. Disinfect lazy susan. Replace salt/pepper. Disinfect tables/chairs
- Activity and game room: Disinfect. Destroy what cannot be disinfected
- Wash clean and soiled laundry separately. Bleach washer between soiled and clean laundry
- Apts: Clean mop heads between apartments. Clean carpets. Bleach surfaces w/in reach, esp contact areas
- Professionally steam clean carpet/furniture in lounge/mailbox area
- Disinfect wet vac floor machine with bleach between uses
- Mask and glove (minimum) when cleaning V/D

In addition to having two sanitarians on site for the first day, a sanitarian stopped by the second day and I went back on the fourth day to meet with housekeeping and administration to address any additional questions and to plan for the next outbreak.

Health Policy

- Managers
 - Monitor employee health (“flu” unacceptable)
 - Remove disincentives to report illness
 - Penalty for working while contagious
- Employees
 - Know health policy
 - Sick leave is ‘contagious’ leave
 - Unused sick leave is not deferred compensation

The next important lesson is health policy

Management can help by monitoring employee health and not accepting “flu” as a acceptable reason to be home. It is necessary to identify the symptoms.

Management can also remove disincentives to report illness. In food service some of the establishments were giving paid leave for contagious illness, and others promised that ill employee would be given make up work hours. Also penalties were given for working while contagious. At one facility, employees were fired if they had lied about recent GI illness and worked.

Employees need to know the health policy and particularly that sick leave is for contagious leave. They are not to return to work while contagious.

And employees with paid sick leave should not have disincentives to taking sick leave. In some circumstances, employees can bank unused sick leave and receive it when they retire. This creates a disincentive to use sick leave and defeats the public health purpose. Unused sick leave should not be mixed with deferred compensation

Case C - Complaint

- 12/26 LHD received complaints from 3 separate parties involving 7 persons with diarrhea (7), vomiting (6)
- Common association was restaurant on 12/22 or 12/23. Median incubation 32h

Here is an example of a health policy by an employer.

On December 26 we received complaints from 3 separate parties involving 7 persons with symptoms of gastroenteritis. The common association was a restaurant exposure on December 22 or 23 that was 32 hours before the onset of symptoms.

Case C - Health Policy

- Corporate (FL) monitoring media for NV outbreaks.
- Publicity about outbreak 12/18 at facility 1/2 mile away
- Instituted active monitoring of GI sx in employees before allowing them to work. Paid sick leave.
 - 12/24 sent 3 employees home before work who had GI sx in last 72h
 - 12/26 sent 3 more employees home before work who had GI sx in last 72h
- No patron complaints of GI illness

We called the restaurant and learned that the corporate offices in Florida had been conducting surveillance of the media for norovirus outbreaks.

They had read about the outbreak at the retirement center that was 1/2 mile away.

So they escalated their usual employee health policy and began active monitoring for GI symptoms. They had a questionnaire that the employee had to answer before being allowed to work. If they were ill they sent the employee home. And they offered paid sick leave to those they sent home.

They identified 3 employees on December 24 and 3 more on December 26.

But they had not received any complaints from patrons

Case C - Decontamination

- With illness in patrons associated with the facility, the restaurant closed for decontamination with LHD supervision
- Restaurant was closed for only one evening (12/26)
- No media, no additional patron complaints, no additional illness in employees
- Manager: “It makes sense to close and clean, rather than risk reputation and market share”

When we told them about the complaints that we had received, they closed for decontamination under our supervision.

The restaurant was closed for one evening. There was no media.

They did not receive any more reports of patron illness. They continued to monitor employees and did not identify any additional illness.

Inter-institutional Communication

- Hospital transfer of infectious patients across jurisdictional lines
- No infection control directive from ED

I want to move to observations related to our outbreaks. The first observation deals with transfers.

Hospital transfers of infected individuals is the primary reason for outbreaks in the nursing homes. These folks come in with no information about their recent GI illness or an appreciation that they may still be contagious and that standard, contact and perhaps airborne precautions are needed.

Second, as relates to the retirement home, residents who were seen in the ER for gastroenteritis were returned to the retirement center without directions to prevent spread to others. There were no directions about isolation and no guidance to the administrator or their caregiver about the risk for transmission.

Surveillance Post-intervention

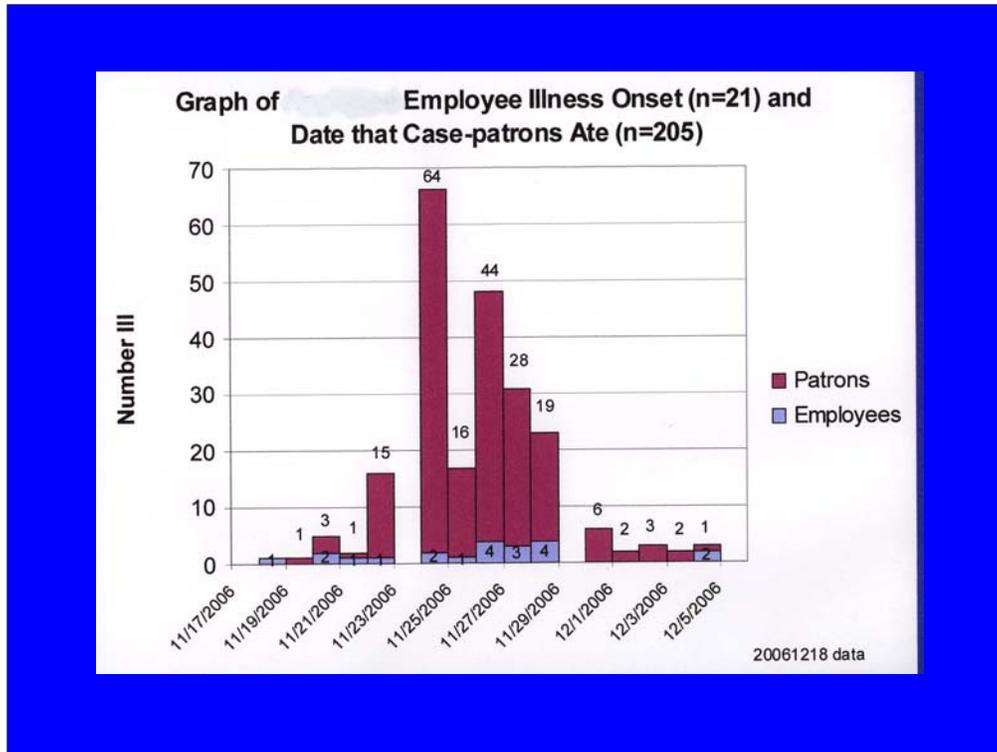
- Surveillance (passive)
 - Under reporting : “Absence of evidence is not evidence of absence”
 - Media perturbation: increase in reporting, historical cases, non-cases
- Canary in the coal mine: Active monitoring of employees x 72h after exposed to ‘cleaned’ environment

Another issue is deciding if your interventions have been effective. Is the outbreak ongoing?

There are problems relying on a passive surveillance system. One is under reporting-so the absence of evidence is not evidence of absence.

The second is that the system is perturbed by publicity-so you are receiving lots of historical reports before the intervention. You are also receiving non-cases.

One think we learned was to do active surveillance of employees-that means calling them daily for 3 days after their exposure to the cleaned environment. You cannot wait until the next time they are due in to work at the food service establishment or nursing home.



Here is an example where we used active monitoring.

This graph displays the date ate for patrons in red and the employee illness onset date in blue. So there was illness in employees. Then the facility had the outbreak explode on Black Friday, the day after Thanksgiving. They closed for cleaning here and reopened.

On 12/4 we had received reports of two parties with GI illness after eating after it reopened, but only one patron from one party fit the latency of 24 to 48 hours. However, as part of daily surveillance of employees two had become ill on 12/4 after working at the facility after it reopened. So not only did we have illness in an employee exposed to the cleaned environment, we also had a customer with a compatible illness. So this met the definition of a new outbreak-two or more unrelated.

We did not know if the employee had acquired norovirus infection outside the facility or if patrons had reintroduced norovirus into the facility. A third option is that asymptomatic employees did disinfecting and maybe one was asymptomatic but contagious. The restaurant elected to close again, disinfect again, and remain closed, this time for 3 days.

Litigation and Cost

- Notes/email/reports: How will attorney use it?
- One file. No 'personal notes'
- Who manages FOIAs?
- Finance - creative cost recovery

Another thing to consider is litigation and cost at the health department.

Recognize that your notes, emails, and reports may end up with an attorney and how will he interpret it.

Keep one file and no "personal notes"

Have a process for dealing with FOIA requests for records.

Involve finance because there is lots of time involved in these outbreaks. Your finance person may be able to engage in some creative cost accounting.

Inform and Manage Media

- Single contact not involved in outbreak
- Spokesperson vs subject matter expert
- What 'image' do you want on camera?
- Reiterate when outbreak not ongoing
- Not everything that can be counted, counts
- Press release, Fact sheet, FAQ
- KISS
- Rehearse aggressively

Inform and manage the media. They are the source for information to the community about secondary prevention and as in the restaurant example, a source for surveillance data for managers and for what is happening in surrounding jurisdictions.

But

Have a single contact person who is not involved in the outbreak. The media will call repeatedly based on their news cycle.

Decide if you want a spokesperson or a subject matter expert. My bias is a spokesperson. I favor plausible deniability. There are two reasons for a not answering a question-ignorance or malice. And with a spokesperson, there is no question. It is ignorance-they just don't have the information

What image do you want on camera. What is the background. One station wanted a shot of the data collection room. Another got a shot of the stack of case reports.

Reiterate when the outbreak is not ongoing-Dr. Graham taught me this one

Recognize that not everything that can be counted, counts. Publicity creates its own outbreak. The press is interested in how many were affected. I am interested in the effect of the intervention.

Prepare a press release, fact sheet and frequently asked questions, but keep it simple stupid, because at least in small media markets the reporter does not have background in contagious disease.

Lastly, rehearse and rehearse your spokesperson aggressively. Practice staying on message. The questions are not malicious, they are just from left field.

Partner

- EH and CD work together
 - Visit site
 - Educate ill and exposed
- LHD partner with congregate settings (schools, camps, day care, SNF, AFC, retirement, hosp, FSEs)
 - Notify of disease activity-teleconf late Nov
 - Attend infect control mtgs.
 - Outbreak preparedness plans, PVI
 - Be there to supervise/ assist with control

Another piece of advice is to partner.

Partner within your agency. In our agency, the sanitarians are very good at the inspection of the kitchens and housekeeping and are very good at the environmental cleanup.

The CD nurses excel at history taking, and education to try to prevent secondary transmission. They may also have a lot of experience in explaining standard, contact and airborne precautions.

And it is important for the health department to partner with the congregate settings. We began teleconferences with the infection control nurses at the hospitals and skilled nursing facilities in late November to encourage outbreak preparedness.

The sanitarians already have a relationship with the food service establishments. We invited ourselves to hospital infection control meetings. We offer to assist with outbreak preparedness plans and emergency responses to public vomiting incidents. If we want to be notified of outbreaks, we need to be able to offer a service. I think we need to be there to supervise and assist with control. And that means after hours.

Case D - Complaint

- Senior from condo hospitalized Saturday Feb 17 with diarrhea and vomiting
- Attending MD learned that friend is also symptomatic
 - Common exposure: Bridge club at community room 32 h before onset of symptoms
- Attending: Chair of infection control committee attended by LHD
 - Attending notifies manager of community room and LHD (10A Sat)

Here is a final example where being a member of infection control and being available after hours may have made a difference.

A senior from a condominium complex was hospitalized on Saturday February 17 with diarrhea and vomiting. She had fallen on the way to the bathroom and had called an ambulance because she lived alone

The attending physician learned that the patient also had a friend with GI symptoms. Their common exposure was the bridge club held at the community room 32 hours before the onset of symptoms.

The attending physician was also chair of the infection control committee. He notified the manager of the community room and the health department.

Case D - Responses

- ED: Disinfect contact surfaces
- EMS: Disinfect interior of ambulance
- Residence: Disinfect wearing PPE
- Hospital
 - Contact and airborne isolation
 - Cohort nursing staff

The hospital and the ambulance did the appropriate disinfection. The manager of the community room arranged to have the condo cleaned and personal protective equipment was worn.

Case D - LHD/Mgr Response

- Community room
 - Not used since Thurs; no food served or stored
 - Closed and decontaminated with LHD supervision including destroying playing cards and score sheets
- Contacted bridge club members (18)-one additional ill
 - Instructed on cleanup, remain home for 48h after sx cease, no food prep for others
- After reopened, monitored staff for GI illness

We met on Saturday and learned that the community room had not been used since Thursday. No food had been served or stored. So the community room remained closed and was decontaminated. If it could not be bleached, it was thrown out. That included the playing cards and the score sheets.

We contacted all of the other bridge members and identified one other ill person. We advised her on methods to avoid secondary transmission.

After the community room reopened, we monitored the staff there and in the adjacent exercise facility for GI illness

Norovirus Symposium - May 31 8A - 12P

- Audience: Long-term and institutional care providers
- Georgian Room, Kalamazoo County Health and Community Services, 3299 Gull Road, 269.373.5200
- Agenda
 - Overview of NV infection
 - Preventing NV in high-risk settings
 - Outbreak recognition, response, control, reporting
 - Policies, procedures, protocols, tools

In the spirit of educating long term and institutional care providers on outbreak response planning, the Kalamazoo Health Department is offering a symposium on May 31.

Acknowledgements

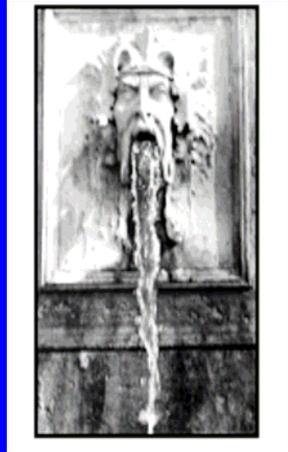
- MDCH: Brenda Brennan, Susan Bohm
- BEDHD:
 - Dur Efaw, Greg Cabose, and EH staff
 - Janet Graham, Mitch Miller, Michelle Henry, and Community Health Staff
 - Stool collection at HD or home: Sara Monks and Jackie Prough
 - Ron Wingate, Rob Rogers - Finance and IT

I hope you have gained some ideas to help you prevent or minimize outbreaks in your jurisdiction.

I want to acknowledge Brenda Brennan from MDCH for her assistance, as well as Susan Bohm, our region I epidemiologist.

I also acknowledge the coworkers at the Barry Eaton Health Department. When we collect stools, we usually have to bring the person to the health department to ensure proper collection. So thanks to Sara Monks, who is now works in the dialysis unit at Spectrum, and Jackie Prough, for their brown thumbs and iron stomachs.

Questions?



Vomiting, also known as:

- Spraying McDonalds
- Make like Mount St. Helens
- Be the mother bird
- Soittaa posliinipuhelimella Norjaan (Finnish for "make a phone call to Norway with a telephone made of porcelain")

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Resources

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- Fact sheet: Guidelines for control of a suspected or confirmed outbreak of viral gastroenteritis in a nursing home. MDCH.
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