

***Clostridium perfringens* Intoxications Associated with a Correctional Facility**

March

Anoka County

On March 17, 2011, the Minnesota Department of Health (MDH) was notified by Anoka County Community Health and Environmental Services (ACCHEs) of gastrointestinal illnesses in inmates at a juvenile correctional facility. The facility's nurse reported that approximately 28 of 30 juvenile inmates and one staff developed diarrhea and vomiting with onsets in the middle of the previous night. An investigation was initiated on March 17. Although initially it was reported that the illnesses were limited to inmates in the juvenile correctional facility, on March 22 a staff person from the workhouse within the same county correctional system contacted ACCHEs to report that he had been ill with gastrointestinal illness with onset late on March 16, and that several workhouse inmates that worked in the painting and laundry crews had experienced gastrointestinal illness around that time.

MDH epidemiology staff contacted the juvenile correctional facility nurse to ascertain if all the illnesses occurred within one area of the facility or several separate areas, and to discuss possible common exposures, such as activities or foods, among the inmates. MDH epidemiology staff interviewed all inmates and some staff from the juvenile correctional facility about illness history and food consumption from March 14 through March 16. A case was defined as a correctional facility inmate or staff person who became ill with vomiting or diarrhea (≥ 3 loose stools in a 24-hour period) on or after March 16.

The ACCHEs Correctional Health Evaluator contacted all health staff at the correctional facilities to ascertain if there were cases of gastrointestinal illness at other locations served by the same central kitchen.

ACCHEs Environmental Health Specialists visited the central kitchen in Anoka on March 17 to evaluate food preparation and handling procedures. Inmates and staff responsible for food preparation were interviewed about recent history of gastrointestinal illness. Food handling procedures were also evaluated at the juvenile correctional facility. Additional discussions with kitchen staff were held from March 17 through March 23.

Stool specimens were submitted to the MDH Public Health Laboratory for testing.

Thirty-seven persons were interviewed, including 26 juvenile inmates from three "pods" or separate areas, eight workhouse inmates, two juvenile facility staff, and one workhouse staff. Two were excluded from analysis because they had mild illness that did not meet the case definition. Among the remaining 35 persons, 32 (91%) met the case definition. All of the cases had diarrhea, 28 (88%) had cramps, 8 (25%) had vomiting, 4 (13%) had fever, and 4 (13%) had blood in the stool. All of the cases had illness onset from March 16 at 7:00 p.m. to March 17 at 7:00 a.m. The median incubation period calculated from dinner on March 16 was 8 hours (range, 0.5 to 13 hours). Among the 13 cases who had recovered at the time of the interview, the median duration was 24 hours (range, 3 to 51 hours). All of the cases that vomited were under the age of 18 years. The illness attack rate at the juvenile correctional facility was 92%.

Four stool samples from cases at the juvenile correctional facility tested positive for *Clostridium perfringens* enterotoxin A. Three were positive for *C. perfringens* by culture, and isolates were

indistinguishable by pulsed-field gel electrophoresis. Of the three specimens that were positive for *C. perfringens* by culture, one also grew a very small amount of *Staphylococcus aureus* (two colonies), and was positive for *S. aureus* enterotoxin D.

By univariate analysis, eating scalloped potatoes and ham for dinner on March 16 (32 of 32 cases vs. 1 of 3 controls; odds ratio [OR], undefined; 95% confidence interval [CI], 3.91 to undefined; $p = 0.01$), and drinking juice served for breakfast on March 14 (19 of 26 cases vs. 0 of 3 controls; OR, undefined; 95% CI, undefined; $p = 0.03$), were significantly associated with illness. Multivariate analysis could not be conducted. However, not all interviewed cases had breakfast on Monday, and the time period from Monday breakfast to the illness onsets is inconsistent with bacterial intoxications caused by *C. perfringens*.

The environmental health evaluation revealed that all the food was prepared centrally at the correctional food service kitchen located in the city of Anoka. The scalloped potatoes and ham were made in a tilting steam-jacketed kettle the same day as service. Dried potatoes were added to boiling water in the kettle and reconstituted in about 15 minutes. Roux made of melted butter and flour was added from an adjacent kettle, and then diced ham (diced the previous day) was added. The production log showed that the food reached 180° F. The food was cooked between noon and 1:00 p.m., transferred to a hot-holding cabinet, and held between 1:00 p.m. and 3:00 p.m. Although the cabinet has a large digital temperature display, the holding temperature was not noted on the log. The food was then transferred to insulated transfer containers and delivered to five locations within the Corrections Department, including the workhouse and the juvenile correctional facility, between 3:00 p.m. and 3:30 p.m. It was then held hot at each of the kitchens from arrival until served. The workhouse inmates reported eating immediately after the food arrived. At the juvenile correctional facility, the food was served between 5:30 p.m. and 6:30 p.m. During the investigation, the kitchen staff at the juvenile correctional facility reported that a safety mechanism was triggered and turned the oven off at some point after the food arrived but before it was served, but the staff did not notice the problem until later. The three “pods” in the juvenile correctional facility were served out of the same large pan of food.

This was an outbreak of *Clostridium perfringens* intoxications associated with eating scalloped potatoes and ham on March 16. Illnesses were identified at two of five facilities served by a central kitchen, suggesting that a problem occurred at the central kitchen. The food most likely was not kept at the correct holding temperature. The workhouse inmates consumed the food upon arrival, precluding the opportunity for additional temperature abuse on-site. Additional temperature abuse at the kitchen at the juvenile facility likely contributed to the high attack rate among juvenile inmates. Since the absence of illnesses at the other three Corrections Department facilities was ascertained by asking each facility’s nurse rather than speaking to inmates directly, it is possible that illnesses also occurred at those three facilities and were not reported to or detected by the nursing staff.