

## Management of food borne illness

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Food borne illness is a serious public health problem. Number of Person dies as a result of food borne illnesses are primarily the very young, elderly and the immunocompromised. Recent changes in human demographics and food preferences, changes in food production and distribution systems, microbial adaptation, and lack of support for public health resources and infrastructure have led to the emergence of novel as well as traditional food borne diseases. With increasing travel and trade opportunities, it is not surprising that the risk of contracting and spreading a food borne illness now exists locally, regionally, and even globally.

This primer is directed to primary care physicians, who are more likely to see the index case of a potential food-related disease outbreak. It is a teaching tool to update primary care physicians about food borne illness and remind them of their important role in recognizing suspicious symptoms, disease clusters, and etiologic agents, and reporting cases of food borne illness to public health authorities.

Specifically, this guide urges physicians to:

- Recognize the potential for a food borne etiology in a patient's illness;
- Realize that many but not all cases of food borne illness have gastrointestinal tract symptoms;
- Obtain stool cultures in appropriate settings, and recognize that testing for some specific pathogens, e.g. *E. coli* O157:H7, *Vibrio* spp., must be requested;
- Report suspect cases to appropriate public health officials;
- Talk with patients about ways to prevent food-related diseases; and
- Appreciate that any patient with food borne illness may represent the sentinel case of a more widespread outbreak.

Food borne illness is considered to be any illness that is related to food ingestion;

gastrointestinal tract symptoms are the most common clinical manifestations of food borne illnesses.

This primer is not a clinical guideline or definitive resource for the diagnosis and treatment of food borne illness. Safe food handling practices and technologies (e.g. irradiation, food processing and storage) also are not addressed. More detailed information on these topics is available in the references and resources listed in this document, as well as from medical specialists and medical specialty societies, state and local public health authorities, and federal government agencies.

### Clinical Considerations

Food-related disease threats are numerous and varied, involving biological and nonbiological agents. Food borne illnesses can be caused by microorganisms and their toxins, marine organisms and their toxins, fungi and their related toxins, and chemical contaminants. During the last 20 years, some foods that have been linked to outbreaks include: milk (*Campylobacter*); shellfish (Norwalk-like viruses); unpasteurized apple cider (*Escherichia coli* O157:H7), eggs (*Salmonella*); fish (ciguatera poisoning); raspberries (*Cyclospora*); strawberries (hepatitis A virus); and ready-to-eat meats (*Listeria*).

While physicians have a critical role in surveillance for and prevention of potential disease outbreaks, only a fraction of the people who experience gastrointestinal tract symptoms from food borne illness seek medical care. In those who do seek care and submit specimens, bacteria are more likely than other pathogens to be identified as causative agents. Bacterial agents most often identified in patients with food borne illness in the United States are *Campylobacter*, *Salmonella*, and *Shigella* species, with substantial variation occurring by geographic area and season. Testing for viral etiologies of diarrheal disease is rarely done, but viruses are considered the most common cause of food borne illness.

### Recognising food borne illnesses

Patients with food borne illnesses typically present with gastrointestinal tract symptoms (e.g. vomiting, diarrhea, and abdominal pain); however, nonspecific symptoms and neurologic symptoms may also occur. Every outbreak begins with an index case who may not be severely ill. A physician who encounters this person may be the only one with the opportunity to make an early and expeditious diagnosis. Thus, the physician must have a high index of suspicion and ask appropriate questions to recognize that an illness may have a food borne etiology.

Important clues to determine the etiology of a food borne diseases are the:

- Incubation period;
- Duration of the resultant illness;
- Predominant clinical symptoms; and
- Population involved in the outbreak.

Additional clues may be derived by asking whether the patient has consumed raw or poorly cooked foods (e.g. raw or undercooked eggs, meats, shellfish, fish), unpasteurized milk or juices, home canned goods, fresh produce, or soft cheeses made from unpasteurized milk. Inquire whether any of the patient's family members or close friends has similar symptoms. Inquiries about living on or visiting a farm, pet contact, day care attendance, occupation, foreign travel, travel to coastal areas, camping excursions to mountains or other areas where untreated water is consumed, and attendance at group picnics or similar outings also may provide clues for determining the etiology of the illness.

If a food borne illness is suspected, submit appropriate specimens for laboratory testing and contact the state or local health department for advice about epidemiologic investigation. For the physician, implication of a specific source in disease transmission is difficult from a single patient encounter. Attempts to identify the source of the outbreak are best left to public health authorities.

Because infectious diarrhea can be contagious and is easily spread, rapid and definitive identification of an etiologic agent may help to control a disease outbreak. An individual physician who obtains testing can contribute the necessary piece of data that ultimately leads to identification of the source of an outbreak.

### Diagnosing food borne illnesses

#### Differential Diagnosis

A variety of infectious and noninfectious agents

must be considered in patients suspected of having a food borne illness. Establishing a diagnosis can be difficult, however, particularly in patients with persistent or chronic diarrhea, those with severe abdominal pain, and when there is an underlying disease process. The extent of diagnostic evaluation depends on the clinical picture, the differential diagnosis considered, and clinical judgment.

If any of the following signs and symptoms occur, alone or in combination, laboratory testing may provide important diagnostic clues (particular attention should be given to very young and elderly patients and to immunocompromised patients, all of whom are more vulnerable):

- Bloody diarrhea
- Weight loss
- Diarrhea leading to dehydration
- Fever
- Prolonged diarrhea (3 or more unformed stools per day, persisting several days)
- Neurologic involvement such as paresthesias, motor weakness, cranial nerve palsies
- Sudden onset of nausea, vomiting, diarrhea
- Severe abdominal pain

In addition to food borne causes, a differential diagnosis of gastrointestinal tract disease should include underlying medical conditions such as irritable bowel syndrome; inflammatory bowel diseases such as Crohn's disease or ulcerative colitis; malignancy; medication use (including antibiotic-related *Clostridium difficile* toxin colitis); gastrointestinal tract surgery or radiation; malabsorption syndromes; immune deficiencies; Brainerd diarrhea; and numerous other structural, functional, and metabolic etiologies. Consideration also should be given to exogenous factors such as the association of the illness with travel, occupation, emotional stress, sexual practices, exposure to other ill persons, recent hospitalization, child care center attendance, and nursing home residence.

The differential diagnosis of patients presenting with neurological symptoms due to a food borne illness is also complex. Possible food-related causes to consider, include recent ingestion of contaminated seafood, mushroom poisoning, and chemical poisoning. Because the ingestion of certain toxins (e.g. botulinum toxin, tetrodotoxin) and chemicals (e.g. organophosphates) can be life-threatening, a differential diagnosis must be made quickly with concern for aggressive therapy and life support measures (e.g. respiratory support, administration

of antitoxin or atropine), and possible hospital admission.

#### Clinical Microbiological Tests

When submitting specimens for microbiological testing, it is important to realize that clinical microbiology laboratories differ in protocols used for the detection of pathogens. To optimize recovery of an etiologic agent, physicians should understand routine specimen collection and testing procedures as well as circumstances and procedures for making special test requests. Some complex tests (e.g. toxin testing, serotyping, molecular techniques) may only be available from large commercial and public health laboratories. Contact your microbiology laboratory for more information.

Stool cultures are indicated if the patient is immunocompromised, febrile, has bloody diarrhea, has severe abdominal pain, or if the illness is clinically severe or persistent. Stool cultures are also indicated if many fecal leukocytes are present, which indicates diffuse colonic inflammation and is suggestive of invasive bacterial pathogens such as *Shigella*, *Salmonella*, and *Campylobacter* species, and invasive *E. coli*. In most laboratories, routine stool cultures are limited to screening for *Salmonella* and *Shigella* species, and *Campylobacter jejuni/coli*. Cultures for *Vibrio* and *Yersinia* species, *E. coli* O157:H7, and *Campylobacter* species other than *jejuni/coli* require additional media or incubation conditions and therefore require advance notification or communication with laboratory and infectious disease personnel.

Stool examination for parasites generally indicated for patients with suggestive travel histories, who are immunocompromised, who suffer chronic or persistent diarrhea, or when the diarrheal illness is unresponsive to appropriate antimicrobial therapy. Stool examination for parasites is also indicated for gastrointestinal tract illnesses that appear to have a long incubation period. Requests for ova and parasite examination of a stool specimen will often enable identification of *Giardia lamblia* and *Entamoeba histolytica*, but a special request may be needed for detection of *Cryptosporidium parvum* and *Cyclospora cayetanensis*. Each laboratory may vary in its routine procedures for detecting parasites.

Blood cultures should be obtained when bacteraemic or systemic infection suspected. Direct antigen detection tests and molecular biology techniques are available for rapid identification of certain bacterial, viral, and parasitic agents in clinical

specimens. In some circumstances, microbiological and chemical laboratory testing of vomitus or implicated food items also is warranted. For more information on laboratory procedures for the detection of food borne pathogens, consult an appropriate medical specialist, clinical microbiologist, or state public health laboratory.

#### Treatment

Selection of appropriate treatment depends on identification of the responsible pathogen (if possible) and determining if specific therapy is available. Many episodes of acute gastroenteritis are self limiting and require fluid replacement and supportive care. Oral rehydration is indicated for patients who are mildly to moderately dehydrated; intravenous therapy may be required for more severe dehydration. Because many anti-diarrheal agents have potentially serious adverse effects in infants and young children, their routine use is not recommended in this age group.

Choice of antimicrobial therapy should be based on:

- Clinical signs and symptoms;
- Organism detected in clinical specimens;
- Antimicrobial susceptibility tests; and
- Appropriateness of treating with an antibiotic

Knowledge of the infectious agent and its antimicrobial susceptibility pattern allows the physician to initiate, change, or discontinue antimicrobial therapy. Such information also can support public health surveillance of infectious disease and antimicrobial resistance trends in the community. Antimicrobial resistance has increased for some enteric pathogens, which requires judicious use of this therapy.

#### Surveillance and Reporting

Reporting of food borne illnesses in the United States began more than 50 years ago when state health officers, concerned about the high morbidity and mortality caused by typhoid fever and infantile diarrhea, recommended that cases of "enteric fever" be investigated and reported. The intent of investigating and reporting these cases was to obtain information about the role of food, milk, and water in outbreaks of gastrointestinal tract illness as the basis for public health actions. These early reporting efforts led to the enactment of important public health measures (e.g. the Pasteurized Milk Ordinance) that profoundly decreased the incidence of food borne illnesses.

Often health care professionals may suspect

food borne illness either because of the organism involved or because of other available information, such as several ill patients who have eaten the same food. Health care professionals can serve as the eyes and ears for the health department by providing such information to the local or state public health authorities. Food borne disease reporting is not only important for disease prevention and control, but more accurate assessments of the burden of food borne illness in the community occur when physicians report food borne illnesses to the local or state health department. In addition, reporting of cases of food borne illness by practicing physicians to the local health department may help the health officer identify a food borne disease outbreak in the community. This may lead to early identification and removal of contaminated products from the commercial market. If a restaurant or other food service establishment is identified as the source of the outbreak, health officers will work to correct inadequate food preparation practices, if necessary. If the home is the likely source of the contamination, health officers can institute public education about proper food handling practices. Occasionally, reporting may lead to the identification of a previously unrecognized agent of food borne illness. Reporting also may lead to identification and appropriate management of human carriers of known food borne pathogens, especially those with high-risk occupations for disease transmission such as food workers.

Typically, the appropriate procedure for physicians to follow in reporting food borne illnesses is to contact the local or state health department whenever they identify a specific Notifiable disease. However, it is often unclear if a patient has a food borne illness prior to diagnostic tests, so physicians

should also report potential food borne illnesses, such as when two or more patients present with a similar illness that may have resulted from the ingestion of a common food. Local health departments then report the illnesses to the state health department and determine if further investigation is warranted. In addition to reporting cases of potential food borne illnesses, it is important for physicians to report noticeable increases in unusual illnesses, symptom complexes, or disease patterns (even without definitive diagnosis) to public health authorities. Prompt reporting of unusual patterns of diarrheal/gastrointestinal tract illness, for example, can allow public health officials to initiate an epidemiologic investigation earlier than would be possible if the report awaited definitive etiologic diagnosis.

Finally, new information on food safety is constantly emerging. Recommendations and precautions for people at high risk are updated whenever new data about preventing food borne illnesses become available. Physicians and other health care professionals need to be aware of and follow the most current information on food safety.

#### References

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