

COMPENDIUM OF ACUTE FOODBORNE AND WATERBORNE DISEASES

I. Diseases typified by vomiting after a short incubation period with little or no fever

<u>Agent</u>	<u>Incubation period</u>	<u>Clinical Syndrome</u>	<u>Pathophysiology</u>	<u>Characteristic Foods</u>	<u>Specimens</u>
A. <i>Staphylococcus aureus</i>	30 min - 8 hours; usually 2-4 hours	Vomiting, diarrhea	preformed enterotoxin	sliced/chopped ham and meats, custards, cream fillings	<u>Food</u> : enterotoxin assay (FDA), culture for quantitation and phage typing of staph, gram stain <u>Handlers</u> : culture nares, skin, skin lesions, and phage type Staph. <u>Cases</u> : culture stool and vomitus, phage type Staph.
B. <i>Bacillus cereus</i>	1-6 hours	Vomiting; some patients with diarrhea; fever uncommon	? preformed enterotoxin	cooked rice	<u>Food</u> : culture for quantitation <u>Cases</u> : stool culture
C. Heavy metals • Antimony • Cadmium • Copper • Iron • Tin • Zinc	5min-8 hours; usually <1 hour	Vomiting, often metallic taste		foods and beverages prepared / stored / cooked in containers coated / lined / contaminated with offending metal	Toxicologic analysis of food container, vomitus, stomach contents, urine, blood, feces

II. Diseases typified by diarrhea after a moderate to long incubation period, often with fever

<u>Agent</u>	<u>Incubation period</u>	<u>Clinical Syndrome</u>	<u>Pathophysiology</u>	<u>Characteristic Foods</u>	<u>Specimens</u>
A. <i>Clostridium perfringens</i>	6-24 hours	Diarrhea, abdominal cramps; vomiting and fever uncommon	enterotoxin formed <i>in vivo</i>	meat, poultry	<u>Food:</u> enterotoxin assay done as research procedure by FDA, culture for quantitation and serotyping <u>Cases:</u> culture stool for quantitation and serotyping of <i>C. perfringens</i> ; test for enterotoxin in stool. <u>Controls:</u> culture stool for quantitation and serotyping of <i>C. perfringens</i>
B. <i>Bacillus cereus</i>	6-24 hours	Diarrhea, abdominal cramps, and vomiting in some patients; fever uncommon	?enterotoxin	custards, cereals, puddings, sauces, meat loaf	<u>Food:</u> culture <u>Cases:</u> stool culture
C. <i>Vibrio parahaemolyticus</i>	4-30 hours	Diarrhea	tissue invasion, ?enterotoxin	seafood	<u>Food:</u> culture on TCBS, serotype, Kanagawa test <u>Cases:</u> stool cultures on TCBS, serotype, Kanagawa test
D. Salmonella (non-typhoid)	6 hours-10 days; usually 6-48 hours	Diarrhea, often with fever and abdominal cramps	tissue invasion	poultry, eggs, meat, raw milk (cross-contamination important)	<u>Food:</u> culture with serotyping <u>Cases:</u> stool culture with serotyping <u>Handlers:</u> stool culture with serotyping as secondary consideration

II. Diseases typified by diarrhea after a moderate to long incubation period, often with fever - continued

<u>Agent</u>	<u>Incubation period</u>	<u>Clinical Syndrome</u>	<u>Pathophysiology</u>	<u>Characteristic Foods</u>	<u>Specimens</u>
E. Norovirus (formerly, “Norwalk-like viruses”)	15-77 hours; usually 24-48 hours	Vomiting, cramps, diarrhea, headache, fever	unknown	raw or undercooked shellfish; water; many others	Detection of viral RNA in stool or vomitus by reverse transcriptase-polymerase chain reaction (RT-PCR)
F. Rotavirus	16-48 hours	Vomiting, chills, and diarrhea, especially in infants and children	unknown	foodborne transmission not well documents	<u>Cases:</u> stool examination by EM or ELISA; serology <u>Food:</u> culture and serotype
G. <i>Escherichia coli</i> enterotoxigenic (ETEC)	6-48 hours	Diarrhea, abdominal cramps, nausea; vomiting and fever less common	enterotoxin	uncooked vegetables, salads, water, cheese	<u>Cases:</u> stool culture; serotype and demonstration of enterotoxin production; invasiveness assay
H. <i>Escherichia coli</i> enteroinvasive (EIEC)	Variable	diarrhea (might be bloody), fever, abdominal cramps	tissue invasion	same as ETEC above	same as ETEC above
I. <i>Listeria monocytogenes</i> - Invasive Disease	2-6 weeks	Meningitis, neonatal sepsis, fever	?	Milk, soft cheeses	<u>Food:</u> culture, serotype <u>Cases:</u> stool / blood cultures, serotype, serology
<i>Listeria monocytogenes</i> , - Diarrheal Disease	Unknown (3-70 days?)	Diarrhea, fever, abdominal cramps	?	Milk, soft cheeses	same as above
J. <i>Vibrio cholerae</i> non-01 and non-0139	1-5 days	Watery diarrhea	enterotoxin formed <i>in vivo</i> , ?tissue invasion	shellfish	<u>Food:</u> culture on TCBS, serotype <u>Cases:</u> stool cultures on TCBS, serotype

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K. <i>Vibrio cholerae</i> O1 or 0139	1-5 days	Watery diarrhea, often accompanied by vomiting	enterotoxin formed <i>in vivo</i>	shellfish, water or foods contaminated by infected person or obtained from contaminated environmental source	<u>Food:</u> culture on TCBS, serotype <u>Cases:</u> stool culture on TCBS, serotype
L. <i>Shigella</i> spp.	12 hours - 6 days; usually 2-4 days	Diarrhea (often bloody), often accompanied by fever and abdominal cramps	tissue invasion	foods contaminated by infected foodhandler; usually not foodborne	<u>Food:</u> culture and serotype <u>Cases:</u> stool culture and serotype <u>Handlers:</u> stool culture and serotype
M. <i>Escherichia coli</i> enterohemorrhagic (<i>E. coli</i> O157:H7 and others)	1-10 days; usually 3-4 days	Diarrhea (often bloody), abdominal cramps (often severe), little or no fever	cytotoxin	beef, raw milk, water, apple cider, lettuce	<u>Cases:</u> stool culture on sorbitol-MacConkey; isolation of <i>E. coli</i> O157:H7 or other Shiga-like toxin-producing <i>E. coli</i> from clinical specimen
N. <i>Yersinia enterocolitica</i>	1-10 days; usually 4-6 days	Diarrhea, abdominal pain (often severe)	tissue invasion, ?enterotoxin	pork products, milk, food contaminated by infected human or animal	<u>Food:</u> culture on CIN agar, cold enrichment <u>Cases:</u> stool culture on CIN

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O. <i>Cyclospora cayetanensis</i>	1-11 days; median: 7 days	Fatigue, protracted diarrhea, often relapsing	tissue invasion	raw produce; water	<u>Food/water:</u> consult DPD <u>Cases:</u> stool examination for organisms; PCR (developmental) and testing for oocyste sporulation at DPD
P. <i>Cryptosporidium parvum</i>	2-28 days; median: 7 days	Diarrhea, nausea, vomiting; fever	tissue invasion	uncooked foods; water	<u>Food/water:</u> consult DPD <u>Cases:</u> stool examination for organisms or antigen; PCR and serologic test developmental (consult DPD)
Q. <i>Giardia lamblia</i>	3-25 days; median: 7 days	Diarrhea, gas, cramps, nausea, fatigue	?	uncooked foods; water	<u>Food/water:</u> consult DPD <u>Cases:</u> detection of antigen or organism in stool, duodenal contents, or small-bowel biopsy specimen

III. Botulism

<u>Agent</u>	<u>Incubation period</u>	<u>Clinical Syndrome</u>	<u>Pathophysiology</u>	<u>Characteristic Foods</u>	<u>Specimens</u>
<i>Clostridium botulinum</i>	2 hours - 8 days; usually 12-48 hours	Illness of variable severity; common symptoms include diplopia, blurred vision, and bulbar weakness; paralysis, which is usually descending and bilateral, might progress rapidly	preformed toxin	improperly canned or similarly preserved foods	<u>Food:</u> toxin assay <u>Cases:</u> serum and stool for toxin assay; stool culture for <i>C. botulinum</i>

IV. Diseases most readily diagnosed from history of eating a particular type of food

<u>Agent</u>	<u>Incubation period</u>	<u>Clinical Syndrome</u>	<u>Pathophysiology</u>	<u>Characteristic Foods</u>	<u>Specimens</u>
A. Poisonous mushrooms	variable	Usually vomiting and diarrhea, other symptoms differ with toxin		wild mushrooms	<u>Food</u> : speciation by mycetologist
B. Other poisonous plants	variable	variable		wild plant	<u>Cases</u> : vomitus, blood, urine. <u>Food</u> : speciation by botanist; stool may sometimes be helpful in confirmation.
C. Scombroid toxin (histamine)	1 min-3 hours; usually <1 hour	Flushing, dizziness, burning of mouth and throat, headache, gastrointestinal symptoms, urticaria, and generalized pruritus	histamine	scombroid fish (tuna, mackerel, etc.); mahi-mahi, others	<u>Food</u> : histamine levels
D. Ciguatoxin	1-48 hours; usually 2-8 hours	Usually GI symptoms (diarrhea, nausea, vomiting) followed by neurologic symptoms (including paresthesia of lips, tongue, throat, or extremities) and reversal of hot and cold sensation	ciguatoxin	large ocean fish, e.g., grouper, barracuda	<u>Food</u> : stick test for ciguatoxin (not widely available)

IV. Diseases most readily diagnosed from history of eating a particular type of food - continued

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E. Paralytic shellfish poisoning	< 1 hour	vomiting, diarrhea, paresthesias of face and extremities, sometimes more severe neurologic symptoms	saxitoxin	mussels, clams, scallops, oysters	<u>Food</u> : Detection of toxin in epidemiologically implicated food
F. Pufferfish poisoning (tetrodotoxin)	10 min - 3 hours	Nausea, vomiting, paresthesias, dizziness, may progress to paralysis and death in hours	tetrodotoxin	pufferfish, others	<u>Food</u> : Detection of toxin in epidemiologically implicated food