

<b>CMHC INFECTION CONTROL POLICY MANUAL</b>	Effective Date: 08/11/16	<b>NUMBER: B-14.26</b>
	Replaces: 08/13/15	
	Formulated: 12/01	Page <u>1</u> of <u>2</u>
<b>GASTROINTESTINAL ILLNESS</b>		

**POLICY:** In the event of an outbreak of illness suspected of being foodborne, appropriate actions will be taken to identify and isolate the source of contamination.

**DEFINITION:**

An **outbreak** is an incident in which an unusual number of persons experience a similar illness after exposure to a common source. Although outbreaks of gastrointestinal illness are usually foodborne, they may also be waterborne or the result of person-to-person contact. **Exception:** *one* case of botulism or chemical poisoning constitutes an outbreak.

**PROCEDURES:**

- I.** Initiate appropriate **patient care**.
- II.** The Infection Control Nurse (ICN) or designee nurse will maintain and submit a daily **log** (Attachment A) of offenders complaining of illness. The log should include each offender's name, TDCJ#, housing area, work assignment, date of onset, predominant symptoms, and treatment. The log should be emailed or Faxed (936-437- 3572) to the Office of Public Health each morning by 9AM. This will help characterize the outbreak and provide important information for determining the cause of the outbreak. Appendix A should be reviewed to determine the probable pathogen.
- III.** The **unit health administrator/ practice manager and/or nurse manager** will contact the **food service supervisor** to make sure that sample trays for all meals in the preceding 72 hours continue to be held for possible future testing. Trays should be held refrigerated until the health department or other investigating team confirms they are no longer needed. The need to keep the trays should be communicated to everyone who might be in a position to discard the trays prematurely, including offenders who may be tasked with disposing trays under routine circumstances. They may be discarded after 14 days if they have not been requested.
- IV.** Obtain appropriate **clinical specimens** as soon as possible.
  - A. Specimens of diarrheal stool should be collected
    1. from 5-7 ill offenders, including all ill foodhandlers, within 48 hours of illness onset and prior to the start of antibiotics
    2. from well foodhandlers within 24 hours of being directed to do so by the health department (this does not usually occur)

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<b>GASTROINTESTINAL ILLNESS</b>		

- B. Specimens of emesis should be collected from 5-7 ill offenders, including all vomiting foodhandlers, if staphylococcal food poisoning is suspected.
  - C. Clinical specimens (up to 7) should be sent to the Texas Department of Health Laboratory using the G-2A submission form (Attachment B), following the instructions in (Attachment C). Follow-up tests for cure, if required, should be submitted to the unit's regular reference lab.
- V. If a foodborne outbreak is **suspected**, the unit medical director and the Office of Public Health will be notified as soon as possible. The medical director or his/her designee is responsible for obtaining copies of the menus for all meals served in the 72 hours preceding the onset of the outbreak. The Office of Public Health will assist with preparing a food history questionnaire to be administered to ill offenders and non-ill control offenders.
  - VI. If a Gastrointestinal Illness is suspected (based on symptomatology) or confirmed (based on laboratory results) as being the cause of the outbreak, implement "Control Measures for a Gastrointestinal Illness Outbreak" (Attachments D, E, and F).
  - VII. The routine use of loperimide should be discouraged when an outbreak situation is in effect. In addition, loperimide should not be used in those who have a known infection such as norovirus or C. difficile. It should not be used in those who have hepatic failure since it can precipitate hepatic encephalopathy.
  - VIII. The unit **health administrator** is responsible for coordination with the unit safety office to inspect food service areas, food preparation areas, and water supply (if necessary). The unit health administrator will also coordinate with the warden's office to make sure the medical department becomes aware of staff illnesses that may be related to the outbreak.

References:

CDC: *Foodborne Disease Surveillance Procedures to Investigate Foodborne Illness*  
 International Association of Milk, Food, and Sanitarians, Inc. 3rd ed, 1976.

Texas Department of Health Division of Infectious Disease Epidemiology and Surveillance:  
 Foodborne Disease Outbreak Manual. March 1999.

ATTACHMENT A

CORRECTIONAL MANAGED HEALTH CARE  
GASTROINTESTINAL ILLNESS OFFENDER PATIENT REPORT

ATTACHMENT B

PLEASE UTILIZE THE TEXAS DEPARTMENT OF STATE HEALTH SERVICES (TDSHS)

ATTACHMENT B (G-2A) FORMS

## Laboratory Submission Procedures

Specimens should be submitted to the Texas Department State Health Services (TDSHS) Laboratory only for investigation of outbreaks. Such specimens should be submitted directly to TDSHS; do not submit them through your regular reference lab. The need to submit specimens to TDSHS should be coordinated with either a representative of the state or local health department or with the Office of Public Health. After hours the Office of Public Health can be contacted through the Emergency Action Center, and TDSHS can be contacted at 512-458-7111.

All specimens must be submitted with a TDSHS form G-2A for each specimen.

- Use **BOLD CAPITAL BLOCK LETTERS** to complete all information that is requested on the form.
- **Unidentified or improperly identified specimens are unsatisfactory and they will not be tested.**
- TDSHS will test specimens identified by number only; however, they will not report the results until a patient's name is provided. Good laboratory practice recommends, and their federal license requires, the patient's name on the specimen vial.
- Questions about specimen submission may directed to the TDSHS Laboratory at 512-458-7598

***THE PATIENT'S NAME ON THE SPECIMEN IDENTIFICATION FORM AND THE SPECIMEN MUST BE THE SAME. IF THEY ARE NOT THE SAME, THE SPECIMEN WILL NOT BE TESTED.***

### Stool specimens

For detection of bacteria:

- Use either Cary-Blair or Ames transport media.
- Rotate swab in stool or soiled underwear for 15 seconds and place swab in transport medium.
- A rectal swab (Culturette) is also an acceptable alternative.
- Label the tube with the patient's name and date of collection.
- Ship specimen to the lab immediately after collection: specimens older than 3 days are unacceptable.

For detection of viruses:

- Collect stool within 48 hours of onset of illness.
- If stool is formed, place at least a pea-sized piece of stool in a sterile container.
- If stool is watery, place at least 2 mL of stool in the sterile container.
- Do not add any transport media or other liquid to the specimen.
- Make sure the container is tightly closed. Apply tape to seal the closure.
- Label the container with the patient's name and date of collection.  
Ship the specimen(s) in an insulated container (such as a styrofoam ice chest) with enough ice packs to keep the specimen(s) cool for at least 48 hours. Ship the G-2A forms with the specimens, placing them in a sealed plastic bag to protect them from getting wet.
- Do not freeze the specimens.
- Ship the specimens by bus or overnight service to the TDSHS Laboratory. The laboratory visits the bus station in Austin twice a day on regular work days, and once daily on Saturday, Sunday and holidays.

**If you are uncertain whether to test for bacteria or virus, submit specimens as if for virus detection; bacterial cultures can be prepared from those specimens if necessary.**

If a toxin is suspected, collect several mL of vomitus and submit the specimen as directed for virus detection in stool (ie, fresh emesis fluid in a sterile container).

Specimens must be shipped in a triple container. The specimen container is the inner container, which must be placed inside another container (to contain leaks), along with enough absorbant material to completely absorb the liquid if the inner container were to leak, before being placed in the outer shipping container. The outer container may be a styrofoam ice chest or similar container. The middle container can be a zip lock plastic bag.

The TDSHS laboratory provides suitable shipping containers which may be used if they are available in a timely manner.

Ship the specimens to:

Bureau of Laboratories  
Texas Department of Health  
1100 West 49<sup>th</sup> Street  
Austin, TX 78756

The laboratory visits the bus station in Austin twice a day on regular work days, and once daily on Saturday, Sunday and holidays.

## Control Measures for Gastrointestinal Illness/Norovirus Outbreaks

### Background

Many Gastrointestinal Illnesses (GI) are small viruses that cause acute stomach pain and diarrhea and usually lasts 1-3 days. Typical symptoms include nausea, vomiting, and diarrhea. Low-grade fever, abdominal pain, and chills may also be present. Although antibiotics are ineffective, the symptoms may be treated with antimotility agents, anti-nausea agents, and – occasionally – with IV fluids. Many (GI) illnesses **are extremely contagious. They are** easily transmitted by

1. the fecal-oral route
  - a. food, drinks, or ice handled by an ill foodhandler
  - b. putting anything to the lips or in the mouth with hands that have touched a contaminated surface or object
2. close contact (less than 6 feet) with vomiting patients

Although outbreaks may start off from a common source such as food handled by a sick foodhandler, person-to-person spread usually occurs.

There can be billions of viruses in one droplet of vomit or stool, and as few as 10 viruses can cause sickness if swallowed. Unfortunately, some viruses are very hardy and can survive on many surfaces (eg, hand rails, tables, faucet handles, toilets, checkers, dominoes) for up to 3 weeks.

Gastrointestinal illness outbreaks at individual units usually last about 2 weeks if control measures are strictly followed.

### Definitions

**Cohort:** Co-housing a group of offenders with the same exposure to an infectious disease. Intermingling in common areas with offenders from other housing areas is prohibited.

**Common Areas:** Hallways, chow halls, day rooms, dorms, recreation areas, pill windows, clinic areas, holding tanks, bathrooms, and buses.

**Disinfection:** The process of destroying contagious/infections organisms such as viruses and bacteria. Although some infectious agents are destroyed by Double D, gastrointestinal illness cannot be destroyed in this manner. Bleach must be used.

**Medical Restriction:** **A process used to interrupt the transmission of an infectious disease by removing contagious offenders from other offenders, for the duration of the infectious period and for monitoring exposed susceptible offenders for possible signs or symptom of the illness for the duration incubation period.**

**Outbreak:** more than the expected number of patients with the same complex of symptoms.

**Screening:** The process of checking individuals for symptoms that could be caused by gastrointestinal illness. See Attachment E, “Offenders Gastrointestinal Illness Screening.”

**Symptomatic:** A person is considered symptomatic of a possible norovirus infection if they have any one of the symptoms known to be caused by norovirus: nausea, vomiting, or diarrhea.

## Kitchen Workers/Foodhandlers

1. Monitor each shift of kitchen staff as they report for duty: ask them about nausea, vomiting, and diarrhea. Also encourage offenders to report symptoms that occur while on duty. Do not allow anyone to work in the kitchen or other food handling area (eg, handing out food trays/johnnies, egg collection, meat handling) if they have any symptoms (nausea, vomiting, or diarrhea). Send all ill offenders to medical for evaluation. Early warning signs of gastrointestinal illness may be very subtle. During an outbreak, kitchen workers who have loss of appetite or mild abdominal discomfort should not be allowed to work in the kitchen.
2. Workers who have been symptomatic must be excluded from food handling for 14 days after their symptoms have resolved.
3. Foodhandlers must wash their hands with soap at the beginning of each shift, after using the bathroom, and any time their hands become soiled.
4. Foodhandlers should wear gloves. A new pair should be put on any time a worker changes an assignment, goes to the bathroom, or inadvertently touches his or her face.
5. General population offenders may eat in the dining hall, but should eat in groups according to housing area with disinfection of the dining hall between housing groups.

## Housekeeping/Cleaning

1. All cleaning must be done with a **10% bleach solution**. The bleach solution should be sprayed on and allowed to air dry for at least 10 minutes. The formula for the 10% bleach solution is:
  - a. 8 oz of powdered bleach to 1 gallon of water
  - b. 12.8 oz of liquid bleach to 1 gallon of water
2. The following areas need special attention:
  - a. chow hall (eg, table tops, railings, door handles) and any mobile food carts must be disinfected **between** the feeding of groups of offenders from separate housing areas
  - b. showers must be disinfected
    - I. at least daily
    - II. after each housing area if shared by multiple housing areas
    - III. after offenders from medically restricted housing shower
    - IV. after offenders from isolated housing shower
  - c. Other common areas should be disinfected at least twice a day
  - d. Hand-contact areas/items on the unit (such as light switches, door handles, railings, pill windows, day room tables, lavatory handles, and toilet levers) should be disinfected at least twice a day. "Continuous (ie, finish and then promptly begin again)" disinfection of these areas is likely to hasten resolution of the outbreak
  - e. Seats and hand contact areas of vehicles used for transport at least daily
  - f. Hand-contact items (such as gates, keys shared by employees, balls, weights, checkers, chess pieces, and dominoes) should be disinfected before use by different housing areas
  - g. Cells should be disinfected before receiving a new occupant, after soiling with vomit/stool, and after symptoms have resolved if an occupant was ill
3. Floors and walls do not need to be disinfected, except where hand contact is likely. Janitors should wear personal protective equipment (masks, gown, gloves) when cleaning up diarrhea or vomit

## **Education**

1. Stress good personal hygiene with offenders and staff. Encourage frequent hand washing. Make sure offenders have access to hand soap.
2. Provide Norovirus Fact Sheet to offenders and staff if suspected. (Attachment F)

## **Security**

1. Curtail unit activities except for essential functions such as laundry and feeding. Offenders with work assignments that are essential to basic unit functions may work if they have been free of both diarrhea and vomiting for 24 hours (14 days for food services).
3. Curtail offender transfers between housing areas within the unit until the outbreak has subsided.
4. Suspend visitation for affected (ie, isolated/medically restricted) housing areas
5. Suspend offender transfers on or off affected housing areas except as required for mandatory release or medical emergency. Mandatory releases and offenders needing emergency medical care should be transported in a van or an ambulance.
6. Medically restrict offenders with symptoms of norovirus from other offenders; they should remain in isolation for 7 days after their symptoms have resolved. Single-celled offenders may remain where they are but should not use facilities shared by other offenders without disinfecting prior to use by other offenders. Offenders with similar symptoms and onset dates may be cohorted, if needed
  - a. Offenders should be fed in their cells
  - b. Offenders may shower by themselves after nonaffected housing areas have finished showering for the day; then the showers should be disinfected.
7. Medically restrict exposed offenders in housing areas (ie, cells or dorms) in which an offender has become ill. The restriction shall remain in place for 72 hours after the ill person has been removed from the area, and will start over with each new symptomatic case. During this time, the medically restricted offenders should not participate in any activities that would allow them to intermingle with offenders from nonaffected housing areas.
  - a. Medically restricted offenders should be fed in their housing area or they may be moved as a group to the dining hall after other offenders have finished eating; then the chow hall should be disinfected.
  - b. Groups of medically restricted offenders may shower after non-medically restricted offenders have finished showering for the day; then the showers should be disinfected.

## **Transportation**

Pre-travel screening will be instituted (Attachment E) upon the agreement of the TDCJ Health Services and Correctional Institutions Divisions. If instituted, security will ensure that any offender who indicates that they have nausea, vomiting, or diarrhea by answering “yes” to any of the questions is not allowed onto a vehicle with other offenders. Symptomatic offenders will be isolated and referred for medical evaluation.

## **Medical**

Refer to policy B14.26 in the CMHC Infection Control Manual

TDCJ Health Services  
Correctional Managed Care  
Offender-Patient Gastrointestinal Illness Screening

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

TDCJ#: \_

Date: \_\_\_\_\_

Facility: \_

1. Do you have diarrhea?  Yes
  2. Do you have nausea (upset stomach)?  Yes
  3. Are you vomiting (throwing up)?  Yes
- 

Division de Servicios de Salud de TDCJ  
Cuidado Manejado Correccional

Nombre: \_\_\_\_\_

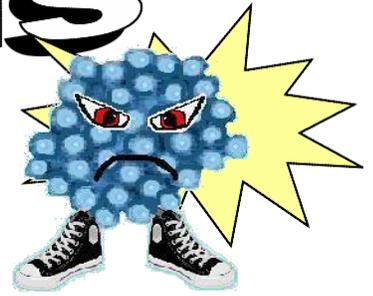
TDCJ#: \_

Fecha: \_\_\_\_\_

Facilidad: \_

1. Tiene usted la diarrea acuosa?  Si
2. Tiene usted la nausea (estomago trastornado)?  Si
3. Vomita usted?  Si

# Norovirus



## What are Noroviruses?

Noroviruses are viruses that cause nausea, vomiting, and diarrhea. They can also cause fever and body aches. Noroviruses are **very** common. They probably cause half of the diarrhea in the United States.

## What are the symptoms?

Most people have:

- Nausea
- Vomiting
- Diarrhea



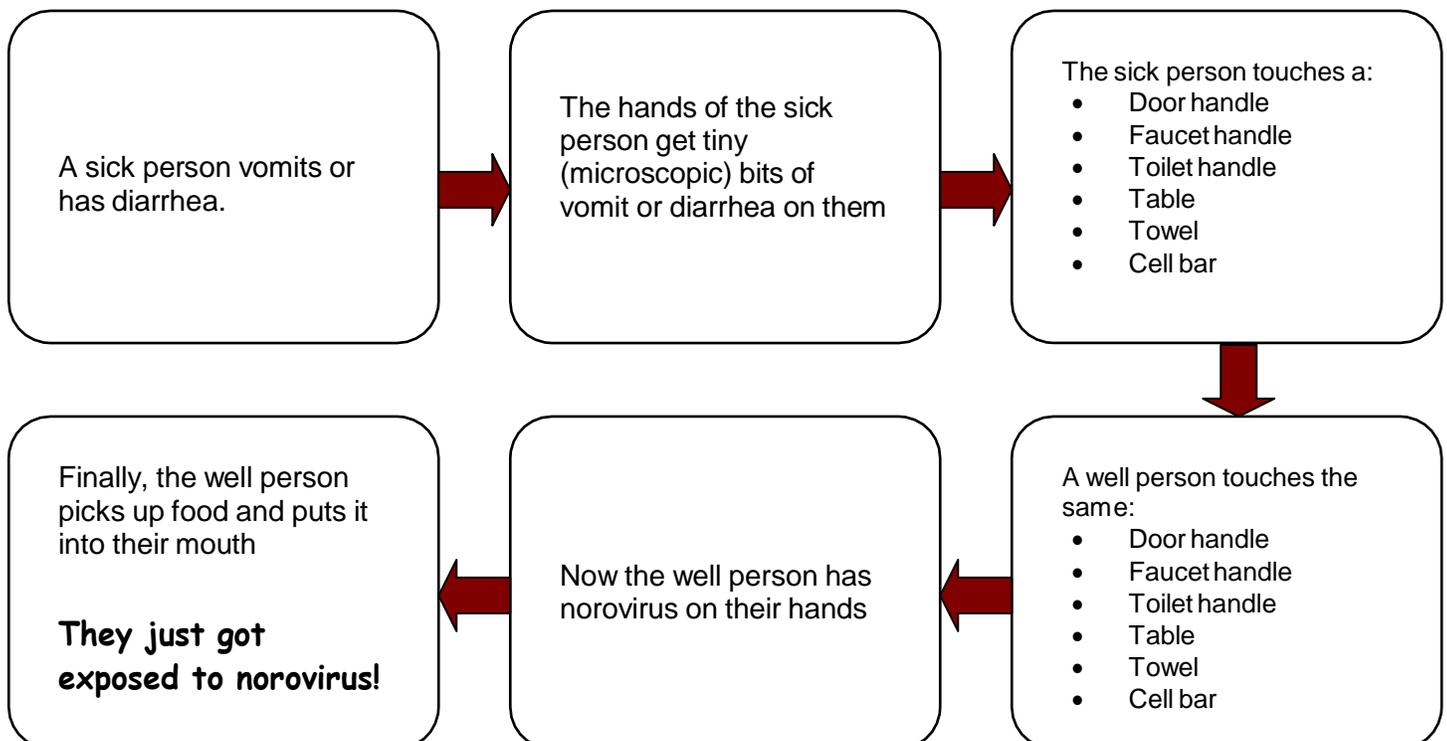
You can also have:

- Muscle aches
- Headache
- Chills
- Fever



## How do you get norovirus?

The stool and vomit of someone with norovirus has billions of viruses in it. In other words, it is **contagious**. Here's what happens:



You are **contagious** as soon as you start to feel bad with norovirus. People can have norovirus in their stool for more than a week.

## How long does it take to get sick?

Once you swallow some norovirus, it usually takes you 24 to 48 hours to get sick. Sometimes you can get sick even faster – like 12 hours.

## How do you keep from getting norovirus?

- Wash your hands for 15 to 20 seconds with water and soap
  - ✓ After you go to the bathroom
  - ✓ Before you eat
- Dry your hands on a clean towel



## How long does it take to get better?

Most people get better in 1 or 2 days. A few people take a day or two longer to get well.

## Can you take something for it?

Antibiotics don't work for these infections. But other medications may help stop the nausea and slow down the diarrhea.

## How do you clean up after someone who has vomited or had diarrhea?

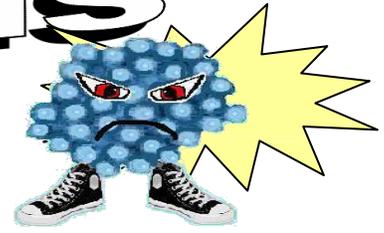
- Protect yourself by putting on:
  - ✓ One set of gloves
  - ✓ A surgical mask
  - ✓ A disposable gown that goes over your first set of gloves
  - ✓ A second set of gloves that go over the cuff of your gown
- Clean up stool or vomit with something that you can throw away
- Then clean the area with a bleach solution. Let the area air dry
- Carefully take off your protective clothing:
  - ✓ Using your gloved hands, pull your gown off in front of you. As you take it off leave your dirty outside set of gloves inside of the gown
  - ✓ Throw away your dirty gown and gloves
  - ✓ **Do not** touch the outside of the gown or gloves
  - ✓ Remove your mask with the inside pair of gloves
  - ✓ Throw away the mask
  - ✓ Now peel off the inside set of gloves and throw them away
- Wash your hands and arms all the way up to your elbows



## Can you get norovirus more than once?

Once you get a norovirus infection, you probably have a few months of immunity. But you can get it again after that.

# Norovirus



## ¿Cuál es norovirus?

Los Norovirus son virus que causan la náusea, vomitando y la diarrea. El virus también puede causar dolores de cuerpo y fiebre. Los Norovirus son muy comunes. Este virus probablemente causa la mitad de la diarrea en los Estados Unidos.

## ¿Cuáles son los síntomas?

La mayor parte de personas tienen:

- Náusea
- Vómitos
- Diarrea



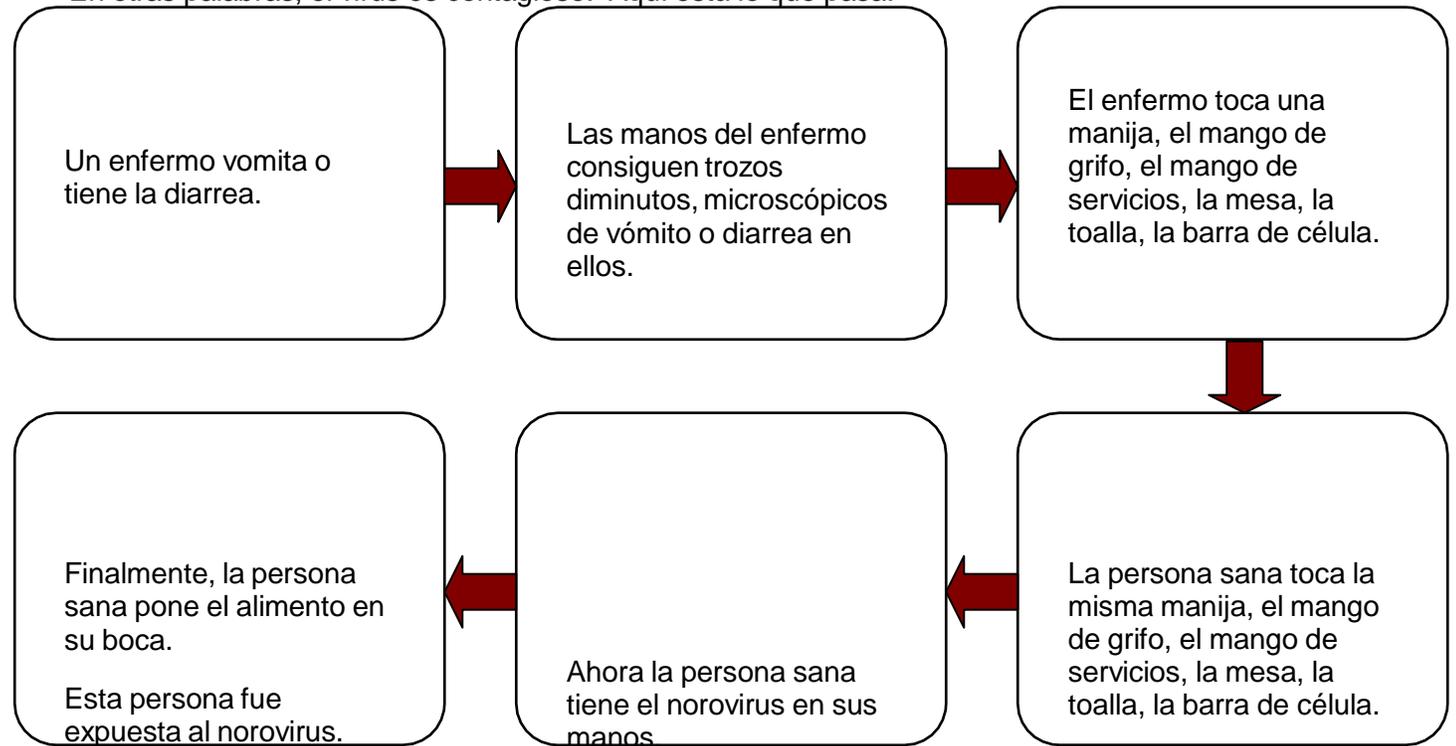
Usted también puede tener:

- Dolores de músculo
- dolor de cabeza
- frialdad
- fiebre



## ¿Cómo consigue usted el norovirus?

El heces y el vómito de alguien con norovirus tienen mil millones de virus en ellos. En otras palabras, el virus es contagioso. Aquí está lo que pasa:



***Usted es contagioso tan pronto como usted se siente enfermo. Una persona puede tener el norovirus en su taburete durante más de una semana.***

## ¿Cuánto toma esto antes de que usted se sienta enfermo?

Una vez que usted traga el norovirus, esto toma 24 a 48 horas para marearse. A veces usted puede sentirse enfermo dentro de 12 horas.

## ¿Cómo previene usted la adquisición del norovirus?

- Lave sus manos durante 15 a 20 segundos con el agua y jabón
  - ✓ Después de que usted va al cuarto de baño
  - ✓ Antes de que usted coma
- Seque sus manos en una toalla limpia.



## ¿Cuánto toma esto para sentirse mejor?

La mayoría de las personas se sienten mejor en 1 ó 2 días. Algunas personas pueden tomar un día o dos más para sentirse mejor.

## ¿Puede usted tomar la medicina para el norovirus?

Los antibióticos no trabajan para el norovirus, pero otras medicaciones pueden ayudar con la náusea y diarrea.

## ¿Cómo limpia usted después de que alguien que ha vomitado o tenía la diarrea?

- Protéjase por poner:
  - ✓ Un par de guantes
  - ✓ Una máscara quirúrgica
  - ✓ Un vestido disponible que cabe sobre sus guantes
  - ✓ Un segundo juego de guantes que cabe sobre el puño de su vestido
- Limpie el vómito o heces con algo que puede ser colocado en la basura
- Limpie el área con una solución de lejía y deje al aire de área seco
- Con cuidado quite su ropa protectora:
  - ✓ No quite sus gantes antes de quitar su vestido. Cuando usted quita su vestido, quita el primer juego de gantes y permiso dentro del vestido
  - ✓ No toque el exterior del vestido sucio o guantes.
  - ✓ Coloque el vestido sucio y guantes en la basura
  - ✓ Quite su máscara todavía llevando puesto el segundo juego de guantes
  - ✓ Coloque su máscara en la basura
  - ✓ Quite sus guantes y lugar en la basura
- Lave sus manos y armas en todo hasta sus codos



## ¿Puede usted conseguir el norovirus otra vez?

Una vez que usted consigue la infección norovirus usted tiene unos meses de la inmunidad, sin embargo usted puede conseguir el virus otra vez.

## Texas Department of Health Foodborne Illness Chart (Agents listed by first symptoms and onset)

Upper Gastrointestinal Symptoms (nausea, vomiting)									
Pathogen/ Poison/ Toxin	Symptoms (by frequency)	Implicated foods or common vehicles	Habitat/ Reservoir	Specimen source <sup>A B C D</sup>	Minimum amount	Laboratory/Diagnostic tests	Storage & transport instructions <sup>E</sup>	Special instructions	
Metallic salts & heavy metals e.g. copper, zinc, tin, cadmium	N, V, altered taste sensation	Lemonade, punch, wine, gelatin dessert containing fruit, beer, carbonated drinks	Metallic containers	Blood, <sup>1</sup> urine, <sup>1</sup> vomitus, <sup>1</sup> food <sup>2</sup>	1 ml blood in purple top test tube	Metal levels <sup>A</sup>		Call Environmental epidemiologist at 512-458-7269	
Nitrites	N, V, cyanosis, HA, dizziness, dyspnea, trembling, weakness, fainting	Spinach & other row crops kept moist at room temperature	Nitrification of fields where plants are grown prior to harvest	Food <sup>2</sup>		Nitrite level <sup>A</sup>		Call Environmental epidemiologist at 512-458-7269	
<i>Staphylococcus aureus</i> heat stable enterotoxin	N, V, D, P, prostration	Meat, seafood, pasta, or salads & sandwich spreads made with eggs or mayonnaise	Nose, throat, skin, food stored at >40 °F	Stool, <sup>1,2</sup> food, <sup>2</sup> wound, <sup>1,2</sup> vomitus, <sup>1,2</sup> throat swab <sup>1,2</sup>	100g food (4oz)	Culture, <sup>1,2</sup> (PFGE if pre-approved by TDH), <sup>3</sup> toxin assay, <sup>2</sup> colony count <sup>1,2</sup>	Food kept at 2-8 °C (32-46 °F); shipped on ice; fully saturate swab for stool; wound, and throat sample; place in Cary-Blair medium	Food <3d old; contact lab <sup>3</sup> for instructions; food specimens accepted only from public health officials or physicians	
<i>Bacillus cereus</i> heat stable emetic toxin	N, V	Starchy food, rice, salads, custards, cereals, pudding, soups	Soil, dust, spices, food stored at >40 °F, spore survives heat	Food <sup>2</sup>	100g food (4oz)	Colony count, <sup>2</sup> identification <sup>2</sup>	Refrigerate specimen at 0-4 °C (32-39 °F); <b>do not freeze specimen</b>	Food specimens accepted only from public health officials or physicians	
<i>Amanita phalloides</i> mushroom heat stable toxin	N, V, D, thirst, pupil dilation, collapse, coma	Food containing mushrooms	Amanita mushrooms (May-June)	Food		Mushroom species identification		Call IDEAS epidemiologist at 512-458-7676	
<i>Streptococcus pyogenes</i>	Sore throat, F, N, V, runny nose, rash	Milk, deviled eggs, or salads & sandwich spreads made with eggs or mayonnaise	Nose, throat, skin	Food, <sup>2</sup> stool, <sup>1</sup> throat swab, <sup>1</sup> wound swab <sup>1</sup>	100g food (4oz)	Culture, <sup>1,2</sup> identification <sup>1,2</sup>	Food kept at 2-8 °C (35-46 °F); shipped on ice; fully saturate swab for stool, wound, and throat sample; place in Stuarts or Amies medium	Food <3d old; contact lab <sup>3</sup> for instructions; food specimens accepted only from public health officials or physicians	
Lower Gastrointestinal Symptoms (diarrhea, abdominal cramps/pains)									
<i>Vibrio cholerae</i> O1, O139, & <i>Vibrio</i> non-O1	Watery diarrhea (rice water stools) C, N, V	Food & water contaminated with feces or vomitus; raw or improperly cooked seafood	Shellfish, copepods, or other zooplankton in brackish waters or estuaries	Stool, <sup>2</sup> rectal swab, <sup>2</sup> food, <sup>2</sup> shellfish, serum <sup>1</sup>	100g food, 150g shellfish, 15 unshucked oysters	Culture, <sup>2</sup> identification, <sup>2</sup> typing, <sup>2</sup> toxin testing, <sup>2</sup> paired sera for <i>Vibrio</i> antibodies <sup>3</sup>	Refrigerate food sample at 0-4 °C (32-39 °F); stool or rectal swab transported in Cary-Blair medium	Food <3d old; shellfish accepted only from public health officials	

Pathogen/ Poison/ Toxin	Symptoms from onset	Symptoms (by frequency)	Implicated foods or common vehicles	Habitat/ Reservoir	Specimen source <sup>A B C D</sup>	Minimum amount	Laboratory/Diagnostic tests	Storage & transport instructions <sup>E</sup>	Special instructions
<i>Vibrio parahaemolyticus</i>	4-30h usual 12-24h	D, C, HA, V, F, wound infections, sepsis	Raw and undercooked seafood	Salt water shellfish; food stored at >40 °F	Stool, <sup>2</sup> shellfish <sup>2</sup>	150g food, <sup>15</sup> unshucked oysters	Culture, <sup>2</sup> identification <sup>2</sup>	Stool transported in Cary-Blair medium; refrigerate food at 0-4 °C (32-39 °F); transport on wet ice and test within 24h	Food <3d old; shellfish accepted only from public health officials
<i>Bacillus cereus</i> heat labile diarrheal toxin	6-24h	D, C, and sometimes N, V	Starchy food, rice, salads, custards, cereals, pudding, soups	Soil, dust, spices; food stored at >40 °F; spore survives heat	Food, <sup>2</sup> stool <sup>2</sup>	100g food (4oz)	culture, <sup>2</sup> identification, <sup>2</sup> colony count <sup>2</sup>	Refrigerate food sample at 0-4 °C (32-49 °F); do not freeze specimen	Food specimens accepted only from public health officials
<i>Clostridium perfringens</i> heat stable spore	6-24h usual 10-12h	C, D	Meat & poultry dishes, sauces, gravies	Dust, soil, human and animal GI tracts; food stored at >40 °F; prefers low oxygen	Stool, <sup>2</sup> food <sup>2</sup>	100g food (4oz)	Culture, <sup>2</sup> identification, <sup>2</sup> colony count <sup>2</sup>	Refrigerate stool and food at 0-4 °C (32-39 °F); do not freeze specimen	Food <3d old; food specimens accepted only from public health officials
<i>Salmonella</i> all serotypes	6-72h usual 12-36h	D, C, F, N, V, HA	High protein foods: meat, poultry, fish, eggs	Human & animal intestinal tracts; food stored at >40 °F	Stool, <sup>2</sup> food, <sup>2</sup> blood <sup>2</sup>	100g food (4oz)	Culture, <sup>2</sup> serotyping, <sup>2</sup> identification, <sup>2</sup> PFGE <sup>2</sup>	Stool in Cary-Blair medium	Food <3d old; food specimens accepted only from public health officials
Enteric viruses: Norwalk-like	10-50h usual 1-2d	F, N, V, P, D, HA	Shellfish, salads, clams, oysters, food handled by infected person	Humans	Fresh stool <sup>2</sup>	1-10g stool sample in sterile plastic container	Electron Microscopy (testing for outbreak investigations only)	Collect specimen in sterile plastic container; keep at 4 °C (39 °F); ship to lab immediately	Collect specimen within 48h after symptom onset; obtain approval for testing at virology (512) 458-7318.
<i>Escherichia coli</i> (non-O157)	12-72h	D, C, N	Meats, cheeses, fecally contaminated food	Human & animal (cattle) feces; can grow at refrigeration temperatures	Stool, <sup>2</sup> food <sup>2</sup>	100g food (4oz)	Culture, <sup>2</sup> identification, <sup>2</sup> toxin detection, <sup>2</sup> PFGE <sup>2</sup>	Stool in Cary-Blair medium; ship food cold at 4 °C (39 °F); do not freeze specimen	Food <3d old; food specimens accepted only from public health officials
<i>Shigella</i> species	1-7d usual 1-3d	D, C, F, N, V	Moist mixed foods, salads, milk, beans, food handled by infected person	Humans	Stool, <sup>2</sup> food, <sup>2</sup> blood <sup>2</sup>	100g food (4oz)	Culture, <sup>1,2</sup> PFGE, <sup>2</sup> grouping <sup>2</sup>	Stool in Cary-Blair medium	Food <3d old; food specimens accepted only from public health officials
<i>Yersinia enterocolitica</i> or <i>pseudotuberculosis</i>	3-7d usual 4-6d	D, F, P, N, V, mimics appendicitis	Pork, milk, tofu, poultry, beef	Pigs, cattle, poultry; grows at 35-40 °F; sensitive to heat at 122 °F	Stool, <sup>2</sup> blood, <sup>1,2</sup> tissue <sup>1,2</sup>	100g food (4oz)	Culture, <sup>1,2</sup> identification <sup>1,2</sup>	Saturate swab with stool and place in Cary-Blair or CTN culture medium	Food <3d old; food specimens accepted only from public health officials

Pathogen/ Poison/ Toxin	Time from onset	Symptoms (by frequency)	Implicated foods or common vehicles	Habitat/ Reservoir	Specimen source <sup>A B C D</sup>	Minimum amount	Laboratory/Diagnostic tests	Storage & transport instructions <sup>E</sup>	Special instructions
<i>Cyclopora</i> species	1-11d medi- an 7d	D, C, fatigue, N, weight loss; can be shed in stool for more than 28	Contaminated water, food, and raw produce	Water	Stool <sup>F</sup>	Use O & P kit	Acid fast stain exam, <sup>2</sup> O & P exam <sup>1,2</sup>	Stool transported in PVA & formalin (O & P kit)	Stool specimens accepted only from public health officials
<i>Campylobacter</i> <i>jejuni</i>	1-10d usual 3-5d	D, C, N, F, HA, malaise, bloody D	Meat, poultry, milk, mushrooms; food stored at >86 °F	Foods of animal origin	Stool, <sup>1,2</sup> food, <sup>2</sup> rectal swab <sup>1,2</sup>	100g food (4oz)	Culture, <sup>1,2</sup> identification <sup>1,2</sup>	Stool in Cary-Blair medium; ship food cold at 4 °C (39 °F); do not freeze specimen	Stool & food specimens only accepted from public health officials
<i>Cryptospori- dium parvum</i>	1-12d mean 7d	D, C, N, F, fatigue, HA, V	Any food handled by infected person; fecally contaminated water	Humans, cattle, other domestic animals	Stool <sup>1,2</sup>	Use O & P kit	Acid fast stain exam, <sup>1,2</sup> O & P exam <sup>1,2</sup>	Stool in PVA & formalin (O & P kit)	Stool specimens accepted only from public health officials
<i>Escherichia coli</i> O157:H7	3-8d	Bloody D and C, hemolytic uremic syndrome	Meats, cheeses, unpasteurized milk, cider, juices, manure fertilized fruits & vegetables	Human & animal (cattle) feces; can grow at refrigeration temperatures	Stool, <sup>2</sup> food <sup>2</sup>	100g food (4oz)	Culture, <sup>2</sup> identification, <sup>2</sup> toxin detection, <sup>2</sup> PFGE <sup>2</sup>	Stool in Cary-Blair medium; ship food cold at 4 °C (39 °F); do not freeze specimen	Stool specimens accepted only from public health officials
<i>Giardia lamblia</i>	3-25d medi- an 7- 10d	D, mucoid fatty stools, gas, C, fatigue, N; shed for months in stool	Food handled by infected person; fecally contaminated water	Humans and other animals	Stool <sup>1,2</sup>	Use O & P kit	Trichrome stain exam <sup>1,2</sup>	Stool in PVA & formalin (O & P kit)	Stool specimens accepted only from public health officials
<i>Entamoeba</i> <i>histolytica</i>	1-8w usual 2-4w	Mucoid or bloody D, F, chills, C	Food handled by infected person; fecally contaminated water	Humans	Fresh stool <sup>F</sup>	Use O & P kit	Culture, <sup>1,2</sup> identification, <sup>1,2</sup> stool trichrome stain exam <sup>1,2</sup>	Stool collected within 5 hours and placed in PVA & formalin (O & P kit)	Stool specimens only accepted from public health officials
<i>Taenia saginata</i>	3-6m	Nervousness, insomnia, P, anorexia, weight loss	Raw or undercooked beef products, food contaminated with tapeworm eggs	Intermediate host cattle; human definitive host	Stool <sup>1,2</sup>	Use O & P kit	Identification of parasite segments in stool <sup>1,2</sup>	Stool in PVA & formalin (O & P kit)	Stool specimens only accepted from public health officials
<i>Taenia solium</i>	3-6m	Nervousness, insomnia, P, anorexia, weight loss	Raw or undercooked pork meats, food contaminated with tapeworm eggs	Intermediate host pigs; human definitive host	Stool <sup>1,2</sup>	Use O & P kit	Identification of parasite segments in stool <sup>1,2</sup>	Stool in PVA & formalin (O & P kit)	Stool specimens only accepted from public health officials
<b>Neurological and/or Gastrointestinal (visual disturbances, vertigo, tingling, paralysis)</b>									
Shellfish toxin	0.5- 3h usual-< 1h	Paresthesias, reversal of hot- cold sensation, muscle aches, D, V	Shellfish, mollusks	Shellfish, mollusks	Shellfish, <sup>2</sup> urine, <sup>1</sup> blood <sup>1</sup>	150g shellfish, 15 unshucked	Toxin assay <sup>C</sup>	Refrigerate food specimen at 0-4 °C (32-39 °F) or freeze	Food specimens accepted only from public health officials

Pathogen/ Poison/ Toxin	Symptoms (by frequency)	Implicated foods or common vehicles	Habitat/ Reservoir	Specimen source <sup>A B C D</sup>	Minimum amount	Laboratory/Diagnost ic tests	Storage & transport instructions <sup>E</sup>	Special instructions
Muscaria-type mushrooms	Salivation, perspiration, pupil dilatation, and wheezing	Foods containing mushrooms	Mushrooms (May-June)	Mushrooms		Mushroom species identification		Call IDEAS epidemiologist at 512-458-7676
Organophos- phate (Pesticide)	N, V, C, D, HA, nervousness, blurred vision, chest pain, cyanosis, confusion, twitching	Contaminated foods	Plants sprayed with pesticides or foods stored in the same area with pesticides	Food, <sup>2</sup> whole blood <sup>1</sup>		Chemical analysis, <sup>2</sup> red cell cholinesterase activity <sup>1</sup>		Call Environmental epidemiologist at 512-458-7269
Ciguatera toxin	Tingling, numbness, dry mouth, pupil dilatation, blurred vision, paralysis	Large predatory reef fish; barracuda, snapper, amberjack, grouper	Large predatory reef fish	Fish, <sup>2</sup> mollusks				Call IDEAS epidemiologist at 512-458-7676
<i>Clostridium</i> <i>botulinum</i> neurotoxins	Blurred vision, muscle weakness, cranial nerve palsies, descending paralysis, mental status changes, respiratory distress, possible death. In infants "floppy baby syndrome"	Home-canned foods, alkaline foods, lightly cured refrigerated foods, smoked fish. In infants: honey, molasses, and syrups	Soil, plants, marine sediments, and fish	Food, <sup>2</sup> stool, <sup>2</sup> vomitus, <sup>2</sup> gastric aspirate, <sup>2</sup> serum <sup>1,2</sup>	100g food, 10ml blood, or 3ml serum	Culture, <sup>2</sup> toxin assay, <sup>2</sup> toxin typing <sup>6</sup>	Collect representative food specimen, keep at 4 °C (39 °F); ship specimen on cold packs. Do not use dry ice. Do not freeze specimen. Hold all other suspect canned foods until testing is completed then dispose of properly	Call IDEAS epidemiologist at 512-458-7676 AND TDH LABORATORY AT: 512-458-7318
Organic mercury, lead, arsenic	Numbness, leg weakness, spastic paralysis, impaired vision, blindness, coma	Crab, shellfish, fish, marine invertebrates	Crab, shellfish, fish, marine invertebrates	Urine		Chemical analysis		Call Environmental epidemiologist at 512-458-7269
Triorthocresyl phosphate	Gastroenteritis, leg pain, high stepping gait, foot and wrist drop	Cooking oil substitute, containi- ng flour, fluid ginger extract, par- sley extract (spiral)	Lubricating oil, certain plastic containers, hydraulic fluid	Oil specimen, <sup>2</sup> food <sup>1</sup>		Chemical analysis		Call Environmental epidemiologist at 512-458-7269
<i>Listeria</i> <i>monocytogenes</i>	Flu-like illness (F, chills, muscle aches, N, and/or D), meningitis, neonatal sepsis, cerebritis	Milk, meats, soft cheese; manure fertilized vegetables	Soil, plants, water; food stored at 30-40 °F	Food, <sup>2</sup> stool, <sup>2</sup> blood, <sup>1</sup> CSF, <sup>1</sup> tissue biopsy <sup>1</sup>	100g food, 5g stool, 0.5ml serum, 10ml CSF	Culture, <sup>1,2</sup> identification, <sup>1,2</sup> typing <sup>6</sup>	Unpreserved stool in Cary- Blair; isolates shipped on nonglucose slants such as trypticase soy or heart infusion agar; all specimens kept at 4 °C (39 °F)	Specimens only accepted from public health officials
<i>Taenia solium</i> Cysticercus(t)	HA, N, V, seizures	Exposure to human stool or food contaminated with cysticerci	Humans	Blood, <sup>3</sup> CSF <sup>1,3</sup>	10ml blood or 5ml serum	MRI or CT detection of cysticerci (cysts) in the brain, <sup>1</sup> serological assay <sup>1,2,3</sup>	Red top test tube for serum	TDH forwards serum to CDC for cysticercosis serological assay

Pathogen/ Poison/ Toxin	Symptoms onset	Symptoms (by frequency)	Implicated foods or common vehicles	Habitat/ Reservoir	Specimen source <sup>A B C D</sup>	Minimum amount	Laboratory/Diagnost ic tests	Storage & transport instructions <sup>E</sup>	Special instructions
<b>Allergic (facial flushing, itching)</b>									
Scombroid histamine	<1-3h usual <1h	HA, N, V, P, flushing, itching, peppery taste	Tuna, mackerel, skipjack, bonito, mahimahi, blue fish	Partially decomposed fish	Fish <sup>2</sup>		Identification of decomposed fish		Call IDEAS at 512-458-7076 or TDH laboratory at 512-458-7318
Monosodium L-glutamate (food additive)	<1h	Mouth numbness, tingling, N, HA: in all when dose >1.5g (less in sensitive people)	Foods prepared with this ingredient	Not applicable	Food <sup>1</sup>		Chemical analysis		Call IDEAS epidemiologist at 512-458-7076
<b>Generalized Infection (fever, chills, malaise, prostration, aches, swollen lymph nodes)</b>									
<i>Salmonella typhi</i>	3d-3m usual 1-3w	Malaise, HA, F, N, V, P, rose spots	Meat, poultry, egg products	Human and animal intestinal tracts; food stored at >40 °F	Stool, <sup>2</sup> food, <sup>2</sup> blood <sup>1</sup>	100g food (4oz)	Culture, <sup>1</sup> PFGE, <sup>1</sup> serotyping <sup>2</sup>	Collect a stool specimen from the suspected carrier & ship laboratory in buffered glycerol saline solution or Cary-Blair transport medium	Collect a stool specimen from the suspected carrier & ship laboratory in buffered glycerol saline solution or Cary-Blair transport medium
<i>Trichinella spiralis</i>	5-45d usual 8-15d	Periorbital edema, gastroenteritis, F, labored breathing	Raw or undercooked meats containing encysted larvae	Swine, dogs, cats, horses, rats, many wild animals	Blood, <sup>3</sup> tissue biopsy, <sup>2</sup> food (meat) <sup>2</sup>	2 ml serum, 100g food (4oz)	Giemsa stain of tissue biopsy, <sup>2</sup> eosin stain of meat, <sup>2</sup> SAT, <sup>1,2</sup> Bentonite Flocculation <sup>3</sup>	TDH forwards serum to CDC. TDH assays food & tissue biopsy. Call TDH laboratory at 512-458-7318 prior to shipping specimen.	TDH forwards serum to CDC. TDH assays food & tissue biopsy. Call TDH laboratory at 512-458-7318 prior to shipping specimen.
<i>Brucella</i> species	5-60d usual 1-2m	F, myalgia, malaise, HA, arthralgia	Raw milk, products from sheep, cows, goats	Cattle, swine, sheep, goats, deer, kennel dogs, coyotes	Stool, <sup>1</sup> food, <sup>2</sup> blood, <sup>1</sup> gastric washing <sup>1</sup>	2ml serum, 100g food (4oz)	Culture, <sup>1</sup> identification, <sup>1</sup> single and paired SAT, <sup>1,2</sup>	Food specimens kept and shipped at 4 °C (39 °F); collect blood specimen in red top test tube	Specimens for testing accepted only from public health officials
<i>Toxoplasma gondii</i>	10- 23d	F, HA, myalgia, rash	Contaminated foods	Cats, rats, birds, feces, dirt	Blood, <sup>1,2</sup> tissue biopsy <sup>1,2</sup>	2ml serum, 100g food (4oz)	Single serum EIA (IgM), paired sera IFA (IgG), <sup>1</sup> giemsa stain of tissue <sup>1</sup>	Collect blood specimen in red top test tube	TDH lab support only available to epidemiologist to investigate outbreaks
<i>Hepatitis A</i>	15- 50d mean 30d	F, N, C, anorexia, later dark urine, jaundice	Oysters, clams, food handled by infected person	Transmitted by fecal/oral route, person to person, shed in stool	Serum, <sup>1,2</sup> <b>Unhemolyzed and not lipemic</b>	2ml serum	Total IgG, <sup>1,2</sup> single serum IgM anti- HAV <sup>1,2</sup>	Collect blood specimen in red top test tube. Ship at 4 °C (39 °F)	TDH lab support available only to epidemiologists to investigate outbreaks

h=hour d=day w=week m=month  
 C=abdominal cramps D=diarrhea F=fever GF=gastrointestinal HA=headache N=nausea P=abdominal pain V=vomiting  
 CSF=cerebrospinal fluid EIA=enzyme immunoassay IFA=indirect fluorescent antibody test PFGE=pulse-field gel electrophoresis SAT=serum agglutination test  
 °C=degrees Centigrade °F=degrees Fahrenheit  
 IDEAS=Infectious Disease Epidemiology and Surveillance Division TDH=Texas Department of Health

<sup>A</sup> Initial (diagnostic) specimens should be routed to the local hospital laboratory and remaining or reference specimens to the Texas Department of Health (TDH) laboratory. TDH forwards certain specimens for testing to federal laboratories and results may not be available for weeks or months.

<sup>B</sup> Food samples for bacteriological analysis: collect a minimum of 100g (4 oz) and a maximum of 450g (1 lb) for each sample, store and ship in a sterile Whirl Pak bag or sterile plastic container at 0-4°C (32-39°F). Frozen foods should remain frozen, however. Send samples to laboratory as soon as the specific food is suspected as a vehicle of transmission. Shellfish samples need to be refrigerated at 0-4°C (32-39°F) and tested within 24h after collection. Alert the laboratory of need to test food sample and ask for further shipping instructions. Approximate conversions for food measures: 100g=4 ounces; 5ml=one teaspoon; 2ml=20-30 drops

<sup>C</sup> Oyster samples for brevitoxin assay need to be maintained in 100ml of 0.18N HCl per 150-200g (5-7 oz) of shucked oyster meat. Samples can be refrigerated or frozen during shipping.

<sup>D</sup> Stool sample analyses require prior approval at (512) 458-7318; shipping containers can be obtained by calling (512) 458-7661; samples for bacteriological culturing are collected in a Cary Blair Culture Swab Transport System (in some cases an unpreserved fresh sample is needed); stool samples for intestinal parasites require division of the sample into two portions: one portion is placed into a vial of formaldehyde, the other in a vial of polyvinyl alcohol (O & P kit); the rectal swab may be shipped without a preservative, in a glycerol saline solution, or inoculated into a specific transport medium depending on the test. Samples may be refrigerated.

<sup>E</sup> General guidelines: (1) clinical human and animal specimens must be transported in a triple container; (2) the specimen container should hold no more than 50ml of specimen; therefore multiple containers may be necessary; (3) the secondary container must be a durable, screw-capped, leak-proof container and not a bag, and must have sufficient absorbent materials to absorb all the content of the primary container in case of leakage; and (4) the outside or tertiary container must be a fiberboard cylinder with a screw-capped lid or similar material. The inner specimen container must be labeled with the patient's name and or specimen identification number (form ID) exactly the way it is written on the laboratory request form. The proper complete laboratory forms must be included outside the second container. The outermost container must be labeled with the name of the laboratory, its full address, and a return full name and address. **Pure isolates of microorganisms require a biohazard label on the outermost container.**

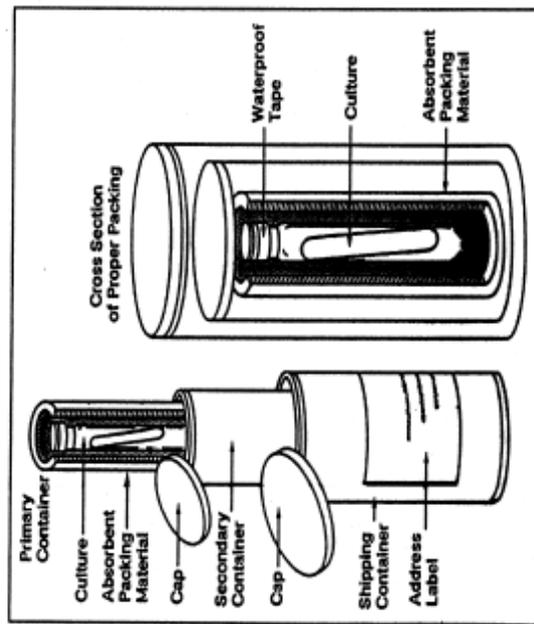
<sup>1</sup> Initial diagnostic test done at local hospital, clinic, commercial, or nearest health department laboratory.

<sup>2</sup> Call the Texas Department of Health Laboratory (TDH) at (512) 458-7598 for submission, collection, and handling instructions; call (512) 458-7661 to obtain shipping containers for pure cultures.

<sup>3</sup> Reference test forwarded to Centers for Disease Control and Prevention (CDC) laboratory.

(TDH, ON11/98, foicr11.wpd)

## Packaging and Labeling of Samples<sup>®</sup>



(label comes in red on white)

## Etiology of Foodborne Disease Outbreaks by Food and Season

Agent	Implicated foods	Season
<b>Bacteria</b>		
<i>Bacillus cereus</i>	Starchy food, rice, salads, custards, cereals, puddings, soups	Year round
<i>Brucella</i>	Raw milk, products from sheep, cows, and goats	Year round
<i>Campylobacter jejuni</i>	Meat, poultry, raw milk, mushrooms	Spring, summer
<i>Clostridium botulinum</i>	Home-canned foods, vegetables, fruits, fish, honey (infants)	Summer, fall
<i>Clostridium perfringens</i>	Meat, poultry dishes, sauces, gravies, Mexican foods	Fall, winter, spring
<i>Escherichia coli</i> , including O157:H7	Meat, cheeses, unpasteurized milk, cider, juices, manure fertilized vegetables and fruits, fecally contaminated food	Summer, fall
<i>Listeria monocytogenes</i>	Milk, meats, soft cheeses, manure fertilized vegetables	Year round
<i>Salmonella</i>	High protein food like meat, poultry, fish, eggs, dairy products	Summer
<i>Shigella</i>	Eggs, salads, lettuce, milk, beans, other moist contaminated foods	Summer
<i>Staphylococcus aureus</i>	Ham, poultry, egg salads, pastries	Summer
<i>Streptococcus pyogenes</i>	Milk, deviled eggs, or salads and sandwich spreads made with mayonnaise and eggs	Summer
<i>Vibrio cholerae</i> O1	Shellfish, oysters	Variable
<i>Vibrio cholerae</i> non-O1	Shellfish, oysters	Unknown
<i>Vibrio parahaemolyticus</i>	Shellfish, oysters	Spring, summer, fall
<i>Yersinia enterocolitica</i>	Pork, milk, tofu, poultry, beef	Winter + ?
<b>Chemicals/Toxins/Poisons</b>		
Ciguatera	Barracuda, snapper, amberjack, grouper	Spring, summer
Histamine fish poison (scombroid)	Tuna, mackerel, bonito, skipjack, mahi-mahi	Year round
Heavy metals	Acidic beverages	Year round
Mushroom poisoning	Mushrooms	Spring, fall
Organophosphates	Any contaminated foods	Year round
Monosodium L-glutamate	Chinese food	Year round
Nitrates	Spinach and other row crops kept moist at room temperature	At harvest
Paralytic shellfish poisoning	Shellfish	Summer, fall
Neurotoxic shellfish poisoning	Shellfish	Spring, fall
<b>Parasites</b>		
<i>Cyclospora cayentanensis</i>	Any contaminated food, water, and raw produce	Spring, summer
<i>Cryptosporidium parvum</i>	Any contaminated food and water	Unknown
<i>Entamoeba histolytica</i>	Food or water handled by infected person	Unknown
<i>Giardia lamblia</i>	Food or water handled by infected person	Summer, fall
<i>Taenia saginata</i>	Raw or undercooked beef products, food contaminated with tapeworm eggs	Year round?
<i>Taenia solium</i>	Raw or undercooked pork products, food contaminated with tapeworm eggs	Year round?
<i>Toxoplasma gondii</i>	Any contaminated food	Year round?
<i>Trichinella spiralis</i>	Raw or undercooked meats containing encysted larvae	Year round?
<b>Viral</b>		
Hepatitis A	Oysters, clams, uncooked foods handled by infected persons	Year round
Norwalk agent	Shellfish, salads, clams, oysters, uncooked foods handled by infected persons	Year round



# Foodborne Illness Diagnostic Chart

(Agents listed by first symptoms and onset)

Pathogen/Poison/Toxin	Symptom onset	Symptoms (by frequency)	Implicated foods or common vehicles	Habitat/Reservoir	Specimen source <sup>A,B,C,D</sup>	Minimum amount	Laboratory/Diagnostic tests	Storage & transport instructions <sup>E</sup>
<b>Upper Gastrointestinal Symptoms (nausea, vomiting)</b>								
Metallic salts & heavy metals e.g. copper, zinc, tin, cadmium	<1h	N, V, altered taste sensation	Lemonade, punch, wine, gelatin dessert containing fruit, beer, carbonated drinks	Metallic containers	Blood, <sup>1</sup> urine, <sup>1</sup> vomitus, <sup>1</sup> food <sup>2</sup>	1ml blood in purple top test tube	Metal levels <sup>A</sup>	Call environmental epidemiologist at (512) 458-7269
Nitrites	1-2h	N, V, cyanosis, HA, dizziness, dyspnea, trembling, weakness, fainting	Spinach & other row crops kept moist at room temperature	Nitrification of fields where plants are grown prior to harvest	Food <sup>2</sup>		Nitrite level <sup>A</sup>	Call environmental epidemiologist at (512) 458-7269
<i>Staphylococcus aureus</i> heat stable enterotoxin	0.5-8h mean 2-4h	N, V, D, P, prostration	Meat, seafood, pasta, or salads & sandwich spreads made with eggs or mayonnaise	Nose, throat, skin, food stored at >40 °F	Stool, <sup>1,2</sup> food, <sup>2</sup> wound, <sup>1,2</sup> vomitus, <sup>1,2</sup> throat swab <sup>1,2</sup>	100g food (4oz) <sup>2</sup>	Culture, <sup>1,2</sup> (PFGE if pre-approved by TDH); <sup>2</sup> toxin assay; <sup>2</sup> colony count <sup>1,2</sup>	Ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b> ; fully saturate swab for stool, wound, and throat specimen; place in Cary-Blair medium
<i>Bacillus cereus</i> heat stable emetic toxin	1-5h usual 2-4h	N, V	Starchy food, rice, salads, custards, cereals, pudding, soups	Soil, dust, spices, food stored at >40 °F; spore survives heat	Food <sup>2</sup>	100g food (4oz) <sup>2</sup>	Colony count; <sup>2</sup> identification <sup>2</sup>	Ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Amanita phalloides</i> mushroom heat stable toxin	6-24h	N, V, D, thirst, pupil dilatation, collapse, coma	Food containing mushrooms	<i>Amanita</i> mushrooms (May-June)	Food <sup>2</sup>		Mushroom species identification	Call IDEAS epidemiologist (512) 458-7676
<i>Streptococcus pyogenes</i>	12-72h	Sore throat, F, N, V, runny nose, rash	Milk, deviled eggs or salads & sandwich spreads made with eggs or mayonnaise	Nose, throat, skin	Food, <sup>2</sup> stool, <sup>1</sup> throat swab, <sup>1</sup> wound swab <sup>1</sup>	100g food (4oz) <sup>2</sup>	Culture, <sup>1,2</sup> identification <sup>1,2</sup>	Ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b> ; fully saturate swab for stool, wound, and throat specimen; place in Stuarts or Aimes medium
<b>Lower Gastrointestinal Symptoms (diarrhea, abdominal cramps/pains)</b>								
<i>Vibrio cholerae</i> O1, O139, & <i>Vibrio</i> non-O1	hrs-5d usual 2-3d	Watery diarrhea (or rice water stools) C, N, V	Food & water contaminated with feces or vomitus, raw or improperly cooked seafood	Shellfish, copepods, or other zooplankton in brackish waters or estuaries	Stool; <sup>2</sup> rectal swab; <sup>2</sup> food, <sup>2</sup> shellfish; <sup>2</sup> serum <sup>1</sup>	100g food, <sup>2</sup> 150g shellfish, <sup>2</sup> 15 unshucked oysters <sup>2</sup>	Culture; <sup>2</sup> identification; <sup>2</sup> typing; <sup>2</sup> toxin testing; <sup>2</sup> paired sera for <i>Vibrio</i> antibodies <sup>2</sup>	Ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b> ; stool or fully saturated rectal swab transported in Cary-Blair medium
<i>Vibrio parahaemolyticus</i>	4-30h usual 12-24h	D, C, HA, V, F, wound infections, sepsis	Raw and undercooked seafood	Salt water shellfish; food stored at >40 °F	Stool, <sup>2</sup> shellfish <sup>2</sup>	150g food, <sup>2</sup> 15 unshucked oysters <sup>2</sup>	Culture; <sup>2</sup> identification <sup>2</sup>	Stool transported in Cary-Blair medium; ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Bacillus cereus</i> heat labile diarrheal toxin	6-24h	D, C, and sometimes N, V	Starchy food, rice, salads, custards, cereals, pudding, soups	Soil, dust, spices, food stored at >40 °F; spore survives heat	Food, <sup>2</sup> stool <sup>2</sup>	100g food (4oz) <sup>2</sup>	Culture; <sup>2</sup> identification; <sup>2</sup> colony count <sup>2</sup>	Ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Clostridium perfringens</i> heat stable spore	6-24h usual 10-12h	C, D	Meat & poultry dishes, sauces, gravies	Dust, soil, human, and animal GI tracts, food stored at >40 °F; prefers low oxygen	Stool; <sup>2</sup> food <sup>2</sup>	100g food (4oz) <sup>2</sup>	Culture; <sup>2</sup> identification; <sup>2</sup> colony count <sup>2</sup>	Ship food <sup>2</sup> and stool overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Salmonella</i> all serotypes	6-72h usual 12-36h	D, C, F, N, V, HA	High protein foods: meat, poultry, fish, eggs	Human & animal intestinal tracts; food stored at >40 °F	Stool, <sup>2</sup> food, <sup>2</sup> blood <sup>2</sup>	100g food (4oz) <sup>2</sup>	Culture; <sup>2</sup> serotyping; <sup>2</sup> identification; <sup>2</sup> PFGE <sup>2</sup>	Stool in Cary-Blair medium; ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
Enteric viruses: Norwalk-like	10-50h usual 1-2d	F, N, V, P, D, HA	Shellfish, salads, clams, oysters, food handled by infected person	Humans	Fresh stool <sup>2</sup>	1-10g stool in sterile plastic container	Electron Microscopy (testing for outbreak investigations only)	<b>Obtain approval</b> for testing at virology (512) 458-7318. Collect specimen in sterile plastic container within 48h after symptom onset; keep cold at 2-8 °C (35-46 °F); <b>ship to lab immediately</b>
<i>Escherichia coli</i> (non-O157)	12-72h	D, C, N	Meats, cheeses, fecally contaminated food	Human & animal (cattle) feces; can grow at refrigeration temperatures	Stool; <sup>2</sup> food <sup>2</sup>	100g food (4oz) <sup>2</sup>	Culture; <sup>2</sup> identification; <sup>2</sup> toxin detection; <sup>2</sup> PFGE <sup>2</sup>	Stool in Cary-Blair medium; ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Shigella</i> species	1-7d usual 1-3d	D, C, F, N, V	Moist mixed foods, salads, milk, beans, food handled by infected person	Humans	Stool; <sup>2</sup> food, <sup>2</sup> blood <sup>1</sup>	100g food (4oz) <sup>2</sup>	Culture, <sup>1,2</sup> PFGE; <sup>2</sup> identification, <sup>2</sup> grouping <sup>2</sup>	Stool in Cary-Blair medium; ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Yersinia enterocolitica</i> or <i>Y. pseudotuberculosis</i>	3-7d usual 4-6d	D, F, P, N, V, mimics appendicitis	Pork, milk, tofu, poultry, beef	Pigs, cattle, poultry; grows at 35-40 °F; sensitive to heat at 122 °F	Stool; <sup>2</sup> blood, <sup>1,2</sup> tissue <sup>1,2</sup>	100g food (4oz) <sup>2</sup>	Culture, <sup>1,2</sup> identification <sup>1,2</sup>	Saturate swab with stool and place in Cary-Blair or CIN culture medium; ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Cyclospora</i> species	1-11d median 7d	D, C, fatigue, N, weight loss; can be shed in stool for more than 28d	Fecally contaminated water, food, and raw produce	Humans	Stool <sup>2</sup>	Use O & P kit	Acid fast stain exam, <sup>2</sup> O & P exam <sup>1,2</sup>	Stool transported in PVA & formalin (O & P kit); stool specimens accepted only from public health officials
<i>Campylobacter jejuni</i>	1-10d usual 3-5d	D, C, N, F, HA, malaise, bloody D	Meat, poultry, milk, mushrooms; food stored at >86 °F	Foods of animal origin	Stool, <sup>1,2</sup> food, <sup>2</sup> rectal swab <sup>1,2</sup>	100g food (4oz) <sup>2</sup>	Culture, <sup>1,2</sup> identification <sup>1,2</sup>	Stool in Cary-Blair medium; ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Cryptosporidium parvum</i>	1-12d mean 7d	D, C, N, F, fatigue, HA, V	Any food handled by infected person, fecally contaminated water	Humans, cattle, other domestic animals	Stool <sup>2</sup>	Use O & P kit	Acid fast stain exam, <sup>1,2</sup> O & P exam <sup>1,2</sup>	Stool transported in PVA & formalin (O & P kit); stool specimens accepted only from public health officials
<i>Escherichia coli</i> O157:H7	3-8d	Bloody D and C, hemolytic uremic syndrome	Meat, cheeses, unpasteurized milk, cider, juices, manure fertilized fruits & vegetables	Human & animal (cattle) feces; can grow at refrigeration temperatures	Stool; <sup>2</sup> food <sup>2</sup>	100g food (4oz) <sup>2</sup>	Culture; <sup>2</sup> identification; <sup>2</sup> toxin detection; <sup>2</sup> PFGE <sup>2</sup>	Stool in Cary-Blair medium; ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b>
<i>Giardia lamblia</i>	3-25d median 7-10d	D, mucoid fatty stools, gas, C, fatigue, N; shed for months in stool	Food handled by infected person; fecally contaminated water	Humans and other animals	Stool <sup>2</sup>	Use O & P kit	Trichrome stain exam <sup>1,2</sup>	Stool transported in PVA & formalin (O & P kit); stool specimens accepted only from public health officials
<i>Entamoeba histolytica</i>	1-8w usual 2-4w	Mucoid or bloody D, F, chills, C	Food handled by infected person; fecally contaminated water	Humans	Fresh stool <sup>2</sup>	Use O & P kit	Culture, <sup>1,2</sup> identification, <sup>1,2</sup> stool trichrome stain exam <sup>1,2</sup>	Stool collected and placed in PVA & formalin (O & P kit) <b>within 2-5 hours of sampling</b>
<i>Taenia saginata</i> & <i>T. solium</i>	3-6m	Nervousness, insomnia, P, anorexia, weight loss	Raw or undercooked beef ( <i>T. saginata</i> ) or pork ( <i>T. solium</i> ) products; food contaminated with tapeworm eggs	Intermediate host cattle ( <i>T. saginata</i> ) or pigs ( <i>T. solium</i> ); human definitive host	Stool <sup>2</sup>	Use O & P kit	Identification of parasite segments in stool <sup>1,2</sup>	Stool transported in PVA & formalin (O & P kit); stool specimens accepted only from public health officials
<b>Neurological and/or Gastrointestinal (visual disturbances, vertigo, tingling, paralysis)</b>								
Shellfish toxin	0.5-3h usual <1h	Paresthesia, reversal of hot-cold sensation, muscle aches, D, V	Shellfish, mollusks	Shellfish, mollusks	Shellfish; <sup>2,C</sup> urine, <sup>1</sup> blood <sup>1</sup>	150g shellfish; <sup>2,C</sup> 15 unshucked shellfish <sup>2,C</sup>	Toxin assay <sup>C</sup>	Refrigerate food <sup>2,C</sup> specimen at 2-8 °C (35-46 °F) or freeze
Muscaria-type mushrooms	0.25-2h usual <1h	Salivation, perspiration, pupil dilatation, wheezing	Foods containing mushrooms	Mushrooms (May-June)	Mushrooms		Mushroom species identification	Call IDEAS epidemiologist at (512) 458-7676
Organophosphate (pesticide)	<1h	N, V, C, D, HA, nervousness, blurred vision, chest pain, cyanosis, confusion, twitching, convulsions	Contaminated foods	Plants sprayed with pesticides or kept in same area with pesticides	Food, <sup>2</sup> whole blood <sup>1</sup>		Chemical analysis; <sup>2</sup> red cell cholinesterase activity <sup>1</sup>	Call environmental epidemiologist at (512) 458-7269
Ciguatera toxin	1-48h usual 1-6h	Tingling, numbness, dry mouth, pupil dilatation, blurred vision, paralysis	Large predatory reef fish: barracuda, snapper, amberjack, grouper	Large predatory reef fish	Fish, <sup>2</sup> mollusks <sup>2</sup>			Call IDEAS epidemiologist at (512) 458-7676
<i>Clostridium botulinum</i> neurotoxins	2h-6d usual 12-36h	Blurred vision, muscle weakness, cranial nerve palsies, descending paralysis, mental status changes, respiratory distress, possible death. In infants floppy baby syndrome <sup>F</sup>	Home-canned foods, alkaline foods, lightly cured refrigerated foods, smoked fish. In infants: honey, molasses, and syrups	Soil, plants, marine sediments, and fish	Food, <sup>2,4</sup> stool, <sup>2,4</sup> vomitus, <sup>2,4</sup> gastric aspirate, <sup>2,4</sup> serum <sup>1,2,4</sup>	100g food, <sup>2,4</sup> 10ml blood, <sup>2,4</sup> or 5ml serum <sup>2,4</sup>	Culture; <sup>2</sup> toxin assay; <sup>2</sup> toxin typing <sup>2</sup>	Collect representative food specimen, keep at 2-8 °C (35-46 °F); ship food <sup>2</sup> overnight on wet ice; <b>do not freeze specimen</b> . Hold all other suspect canned foods until testing is completed, then dispose of properly. <b>Call both IDEAS epidemiologist at (512) 458-7676 AND lab at (512) 458-7318.</b>
Organic mercury, lead, arsenic	>72h	Numbness, leg weakness, spastic paralysis, impaired vision, blindness, coma	Crab, shellfish, fish, marine invertebrates	Crab, shellfish, fish, marine invertebrates	Urine		Chemical analysis	Call environmental epidemiologist at (512) 458-7269
Triorthocresyl phosphate	>72h	Gastroenteritis, leg pain, high stepping gait, foot and wrist drop	Cooking oil substitute, contaminated flour, fluid ginger extract, parsley extract (apiol)	Lubricating oil, certain plastic containers, hydraulic fluid	Oil specimen, <sup>2</sup> food <sup>2</sup>		Chemical analysis	Call environmental epidemiologist at (512) 458-7269
<i>Listeria monocytogenes</i>	varies 3-70d median 3w	Flu-like illness (F, chills, muscle aches, N, and/or D), meningitis, neonatal sepsis, cerebritis	Milk, meats, soft cheeses, manure fertilized vegetables	Soil, plants, water, food stored at 30-40 °F	Food, <sup>2</sup> stool, <sup>2</sup> blood, <sup>1</sup> CSF, <sup>1</sup> tissue biopsy <sup>1</sup>	100g food, <sup>2</sup> 5g stool, 0.5ml serum, 10ml CSF	Culture, <sup>1,2</sup> identification, <sup>1,2</sup> PFGE <sup>2</sup>	Unpreserved stool in Cary-Blair; isolates shipped on nonglucose slants such as trypticase soy or heart infusion agar; all specimens kept at 2-8 °C (35-46 °F)
<i>Taenia solium</i> Cysticerc(us)	>2m	HA, N, V, seizures	Exposure to human stool or food contaminated with tapeworm eggs	Humans	Blood, <sup>1</sup> CSF <sup>1,2</sup>	10ml blood or 5ml serum	MRI or CT detection of cysticerci (cysts) in the brain, <sup>1</sup> serological assay <sup>1,2,3</sup>	Red top test tube for serum <sup>1</sup>
<b>Allergic (facial flushing, itching)</b>								
Scombroid histamine	<1-3h usual <1h	HA, N, V, P, flushing, itching, peppery taste	Tuna, mackerel, skipjack, bonito, mahi mahi, blue fish	Partially decomposed fish	Fish <sup>2</sup>		Identification of decomposed fish	Call IDEAS epidemiologist at (512) 458-7676
Monosodium L-glutamate (food additive)	<1h	Mouth numbness, tingling, N, HA in all when dose >1.5g (less in sensitive people)	Foods prepared with this ingredient	Not applicable	Food <sup>2</sup>		Chemical analysis	Call IDEAS epidemiologist at (512) 458-7676
<b>Generalized Infection (fever, chills, malaise, prostration, aches, swollen lymph nodes)</b>								
<i>Salmonella typhi</i>	3d-3m usual 1-3w	Malaise, HA, F, N, V, P, rose spots	Meat, poultry, egg products	Human intestinal tracts; food stored at >40 °F	Stool, <sup>2</sup> food, <sup>2</sup> blood <sup>1</sup>	100g food (4oz) <sup>2</sup>	Culture, <sup>1</sup> serotyping <sup>2</sup>	Collect a stool specimen from the case-patient and ship to the laboratory in buffered glycerol saline solution or Cary-Blair transport medium
<i>Brucella</i> species	5-60d usual 1-2m	F, myalgia, malaise, HA, arthralgia	Raw milk, products from sheep, cows, goats	Cattle, swine, sheep, goats, deer, kennel dogs, coyotes	Stool, <sup>1</sup> food, <sup>2</sup> blood, <sup>1</sup> gastric washing <sup>1</sup>	2ml serum, 100g food (4oz) <sup>2</sup>	Culture, <sup>1</sup> identification, <sup>1</sup> single and paired SAT <sup>1,2</sup>	Ship food <sup>2</sup> overnight on wet ice at 2-8 °C (35-46 °F); <b>do not freeze specimen</b> ; collect blood specimen in red top test tube
<i>Toxoplasma gondii</i>	10-23d	F, HA, myalgia, rash	Contaminated foods	Cats, rats, birds, feces, dirt	Blood, <sup>1,2</sup> tissue biopsy <sup>1,2</sup>	2ml serum, 100g food (4oz) <sup>2</sup>	Single serum EIA (IgM), <sup>1</sup> paired sera IFA (IgG), <sup>1,4</sup> giemsa stain of tissue <sup>1</sup>	Collect blood specimen in red top test tube <sup>4</sup>
Hepatitis A	15-50d mean 30d	F, N, C, anorexia, later dark urine, jaundice	Oysters, clams, food handled by infected person	Transmitted by fecal/oral route, person to person, shed in human stool	Serum <sup>1,2,4</sup> <b>unhemolyzed and not lipemic</b>	2ml serum <sup>4</sup>	Total IgG, <sup>1,2,4</sup> single serum IgM anti-HAV <sup>1,2,4</sup>	<b>Obtain approval first,</b> <sup>4</sup> specimens only accepted during outbreaks. Collect blood specimen in red top test tube, ship at 2-8 °C (35-46 °F) <sup>4</sup>
Pathogen/Poison/Toxin	Symptom onset	Symptoms (by frequency)	Implicated foods or common vehicles	Habitat/Reservoir	Specimen source <sup>A,B,C,D</sup>	Minimum amount	Laboratory/Diagnostic tests	Storage & transport instructions <sup>E</sup>

h=hour d=day w=week m=month C=abdominal cramps D=diarrhea F=fever GI=gastrointestinal HA=headache N=nausea P=abdominal pain V=vomiting  
 CSF=cerebrospinal fluid EIA=enzyme immunoassay IFA=indirect fluorescent antibody test PFGE=pulse-field gel electrophoresis SAT=serum agglutination test °C=degrees Centigrade °F=degrees Fahrenheit  
 IDEAS=Infectious Disease Epidemiology and Surveillance Division TDH=Texas Department of Health CDC=Centers for Disease Control and Prevention

<sup>1</sup> Initial diagnostic test done at local hospital, clinic, commercial, or nearest health department laboratory.

<sup>2</sup> Call the Texas Department of Health (TDH) Laboratory at (512) 458-7598 for submission, collection, and handling instructions (<3d old food; ship food overnight on wet ice at 2-8 °C (35-46 °F); do not freeze specimen; food only accepted from public health officials); call (512) 458-7661 to obtain shipping containers for pure cultures.

<sup>3</sup> Reference test forwarded by TDH to federal laboratory.

<sup>4</sup> Call TDH IDEAS at (512) 458-7676 for testing authorization **PRIOR** to sampling and submission.

<sup>A</sup> Initial (diagnostic) specimens should be routed to the local hospital laboratory and remaining or reference specimens to the Texas Department of Health (TDH) laboratory. TDH forwards certain specimens for testing to federal laboratories and results may not be available for weeks or months.  
<sup>B</sup> Food specimens for bacteriological analysis: collect a minimum of 100g (4 oz) and a maximum of 450g (1 lb) for each specimen, store and ship in a sterile Whirl Pak bag or sterile plastic container at 0-4 °C (32-39° F). Frozen foods should remain frozen. Send specimens to laboratory as soon as the specific food is suspected as a vehicle of transmission. Shellfish specimens need to be refrigerated at 0-4 °C (32-39 °F) and tested within 24h after collection. Alert the laboratory of need to test food specimen and ask for further shipping instructions. Approximate conversions for food measures: 100g=4 ounces; 5ml=one teaspoon; 2ml=20-30 drops

<sup>C</sup> Oyster specimens for brevetoxin assay need to be maintained in 100ml of 0.18N HCl per 150-200g (5-7 oz) of shucked oyster meat. Specimens can be refrigerated or frozen during shipping.

<sup>D</sup> Stool specimen analyses require prior approval at (512) 458-7318; shipping containers can be obtained by calling (512) 458-7661; specimens for bacteriological culturing are collected in a Cary Blair CultureSwab Transport System (in some cases an unpreserved fresh specimen is needed); stool specimens for intestinal parasites require division of the specimen into two portions: one portion is placed into a vial of formaldehyde, the other in a vial of polyvinyl alcohol (O & P kit); the fully saturated rectal swab may be shipped without a preservative, in a glycerol saline solution, or inoculated into a specific transport medium depending on the test. Samples may be refrigerated.

<sup>E</sup> General guidelines: (1) clinical human and animal specimens must be transported in a triple container; (2) the specimen container should hold no more than 50ml of specimen; therefore multiple containers may be necessary; (3) the secondary container must be a durable, screw-capped, leak-proof container and not a bag, and must have sufficient absorbent materials to absorb all the contents of the primary container in case of leakage; and (4) the outside or tertiary container must be a fiberboard cylinder with a screw-capped lid or similar material. The inner specimen container must be labeled with the patient's name and or specimen identification number (form ID) **exactly** the way it is written on the laboratory request form. The proper complete laboratory forms must be included inside the second container. The outermost container must be labeled with the name of the laboratory, its full address, and a return full name and address. **Pure isolates of microorganisms require a biohazard label on the outermost container.**

Form 59-11116 (revised 4/24/2001)

