

Cyclic Vomiting Syndrome

National Digestive Diseases Information Clearinghouse



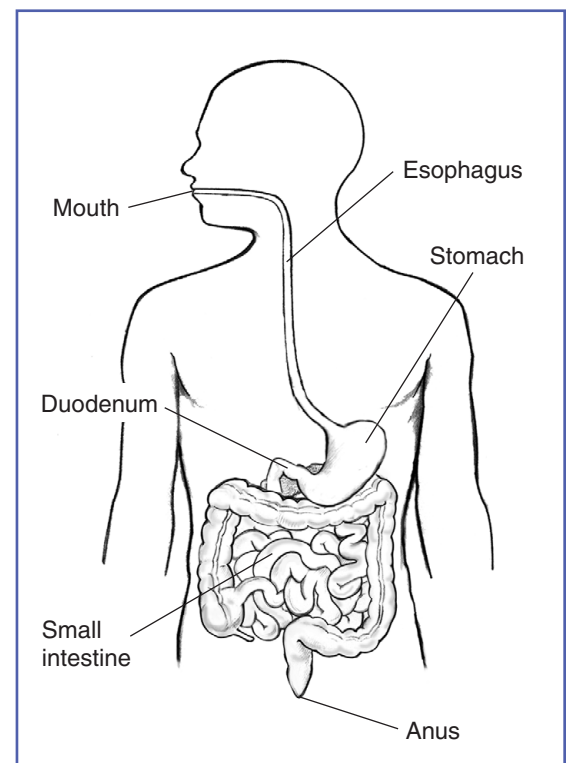
What is cyclic vomiting syndrome?

Cyclic vomiting syndrome, sometimes referred to as CVS, is an increasingly recognized disorder with sudden, repeated attacks—also called episodes—of severe nausea, vomiting, and physical exhaustion that occur with no apparent cause. The episodes can last from a few hours to several days. Episodes can be so severe that a person has to stay in bed for days, unable to go to school or work. A person may need treatment at an emergency room or a hospital during episodes. After an episode, a person usually experiences symptom-free periods lasting a few weeks to several months. To people who have the disorder, as well as their family members and friends, cyclic vomiting syndrome can be disruptive and frightening.

The disorder can affect a person for months, years, or decades. Each episode of cyclic vomiting syndrome is usually similar to previous ones, meaning that episodes tend to start at the same time of day, last the same length of time, and occur with the same symptoms and level of intensity.

What is the gastrointestinal (GI) tract?

The GI tract is a series of hollow organs joined in a long, twisting tube from the mouth to the anus—the opening through which stool leaves the body. The body



Cyclic vomiting syndrome affects the upper GI tract, which includes the mouth, esophagus, stomach, small intestine, and duodenum.

digests food using the movement of muscles in the GI tract, along with the release of hormones and enzymes. Cyclic vomiting syndrome affects the upper GI tract, which includes the mouth, esophagus, stomach, small intestine, and duodenum, the first part of the small intestine. The esophagus is the muscular tube that carries food and liquids from the mouth to the stomach. The stomach slowly pumps the food and liquids through the duodenum and into the rest of the small intestine, which absorbs nutrients from food particles. This process is automatic and people are usually not aware of it, though people sometimes feel food in their esophagus when they swallow something too large, try to eat too quickly, or drink hot or cold liquids.

What causes cyclic vomiting syndrome?

The cause of cyclic vomiting syndrome is unknown. However, some experts believe that some possible problems with bodily functions may contribute to the cause, such as the following:

- gastrointestinal motility—the way food moves through the digestive system
- central nervous system function—includes the brain, spinal cord, and nerves that control bodily responses
- autonomic nervous system function—nerves that control internal organs such as the heart
- hormone imbalances—hormones are a chemical produced in one part of the body and released into the blood to trigger or regulate particular bodily functions

- in children, an abnormal inherited gene may also contribute to the condition

Specific conditions or events may trigger an episode of cyclic vomiting:

- emotional stress, anxiety, or panic attacks—for example, in children, common triggers of anticipatory anxiety are school exams or events, birthday parties, holidays, family conflicts, or travel
- infections, such as a sinus infection, a respiratory infection, or the flu
- eating certain foods, such as chocolate or cheese, or additives such as caffeine, nitrites—commonly found in cured meats such as hot dogs—and monosodium glutamate, also called MSG
- hot weather
- menstrual periods
- motion sickness
- overeating, fasting, or eating right before bedtime
- physical exhaustion or too much exercise

How common is cyclic vomiting syndrome?

Cyclic vomiting syndrome is more common in children than adults, although reports of the syndrome in adults have increased in recent years.¹ Usually, children are about 5 years old when diagnosed with cyclic vomiting syndrome, which occurs in every three out of 100,000 children.²

Who is more likely to develop cyclic vomiting syndrome?

Children who suffer from migraines—severe, throbbing headaches with nausea, vomiting, and sensitivity to light and sound—are more likely to develop cyclic vomiting syndrome.

Up to 80 percent of children and 25 percent of adults who develop cyclic vomiting syndrome also get migraine headaches.¹ People with a family history of migraines may be more likely to develop the syndrome.

People with a history of chronic marijuana use may also be more likely to develop cyclic vomiting syndrome.

What are the symptoms of cyclic vomiting syndrome?

The main symptoms of cyclic vomiting syndrome are severe nausea and sudden vomiting lasting hours to days. A person may also experience one or more of the following symptoms:

- retching, or making an attempt to vomit
- heaving or gagging
- lack of appetite
- abdominal pain
- diarrhea
- fever

- dizziness
- headache
- sensitivity to light

Intensity of symptoms will vary as a person cycles through four distinct phases of an episode:

- **Prodrome phase.** During the prodrome phase, the person feels that an episode of nausea and vomiting is about to start. Often marked by intense sweating and nausea—with or without abdominal pain—this phase can last from a few minutes to several hours. The person may appear unusually pale.
- **Vomiting phase.** This phase consists of intense nausea, vomiting, and retching. Periods of vomiting and retching can last 20 to 30 minutes at a time. The person may be subdued and responsive, immobile and unresponsive, or writhing and moaning with intense abdominal pain. An episode can last from hours to days.
- **Recovery phase.** This phase begins when the vomiting and retching stop and the nausea subsides. Improvement of symptoms during the recovery phase can vary. Healthy color, appetite, and energy return gradually or right away.
- **Well phase.** This phase occurs between episodes when no symptoms are present.

What are the complications of cyclic vomiting syndrome?

The severe vomiting and retching that define cyclic vomiting syndrome increase the chance of developing several complications, including dehydration, esophagitis, a Mallory-Weiss tear, and tooth decay.

- Dehydration may occur when a person does not replace fluids that were lost because of vomiting and diarrhea. When dehydrated, the body lacks enough fluid and electrolytes—minerals in salts, including sodium, potassium, and chloride—to function properly. Severe dehydration may require intravenous (IV) fluids and hospitalization.
- Esophagitis—inflammation or irritation of the esophagus—can result from the stomach acid that exits through the esophagus during vomiting.
- A Mallory-Weiss tear—a tear in the lower end of the esophagus—is caused by severe vomiting. A person with bloody vomit and stool should see a health care provider right away.
- Tooth decay or corroding tooth enamel is damage caused by stomach acid.

Seek Help for Signs or Symptoms of Severe Dehydration

People who have any signs or symptoms of severe dehydration should call or see a health care provider right away:

- excessive thirst
- dark-colored urine
- infrequent urination
- lethargy, dizziness, or faintness
- dry skin

Infants, children, older adults, and people with weak immune systems have the greatest chance of becoming dehydrated. People should watch for the following signs and symptoms of dehydration in infants, young children, and people who are unable to communicate their symptoms:

- dry mouth and tongue
- lack of tears when crying
- infants with no wet diapers for 3 hours or more
- infants with a sunken soft spot
- unusually cranky or drowsy behavior
- sunken eyes or cheeks
- fever

If left untreated, severe dehydration can cause serious health problems, such as organ damage, shock, or coma—a sleeplike state in which a person is not conscious.

How is cyclic vomiting syndrome diagnosed?

A specific test to diagnose cyclic vomiting syndrome does not exist; instead, a health care provider will rule out other conditions and diagnose the syndrome based upon

- a medical and family history
- a physical exam
- a pattern or cycle of symptoms
- blood tests
- urine tests
- imaging tests
- upper GI endoscopy
- a gastric emptying test

Often, it is suspected that one of the following is causing their symptoms:

- gastroparesis—a disorder that slows or stops the movement of food from the stomach to the small intestine
- gastroenteritis—inflammation of the lining of the stomach, small intestine, and large intestine

A diagnosis of cyclic vomiting syndrome may be difficult to make until the person sees a health care provider. A health care provider will suspect cyclic vomiting syndrome if the person suffers from repeat episodes of vomiting.

Medical and Family History

Taking a medical and family history is one of the first things a health care provider may do to help diagnose cyclic vomiting syndrome. He or she will ask the patient to provide a medical and family history.

Physical Exam

A physical exam may help diagnose other conditions besides cyclic vomiting syndrome. During a physical exam, a health care provider usually

- examines a patient's body
- taps on specific areas of the patient's body

Pattern or Cycle of Symptoms in Children³

A health care provider will often suspect cyclic vomiting syndrome in a child when the child

- has at least five separate episodes, or at least three separate episodes over 6 months
- has episodes of intense nausea and vomiting lasting 1 hour to 10 days and occurring at least 1 week apart
- has episodes that are similar to previous ones—they tend to start at the same time of day, last the same length of time, and occur with the same symptoms and level of intensity

- vomits during episodes at least four times per hour for at least 1 hour
- vomits and it is not attributed to another disorder
- has absence of nausea and vomiting between episodes

Pattern or Cycle of Symptoms in Adults^{4,5}

A health care provider will often suspect cyclic vomiting syndrome in adults when the following is present for at least 3 months and the symptoms started more than 6 months ago:

- Each episode of cyclic vomiting syndrome is usually similar to previous ones, meaning that episodes tend to start at the same time of day and last the same length of time—less than 1 week.
- Three or more separate episodes in the past year.
- Absence of nausea or vomiting between episodes.

Blood Tests

A nurse or technician will draw blood samples at a health care provider's office or a commercial facility and send the samples to a lab for analysis. The blood test can tell the health care provider if the patient has any signs of dehydration or other problems.

Urine Tests

Urinalysis involves testing a urine sample. The patient collects a urine sample in a special container in a health care provider's office or a commercial facility. A health care provider tests the sample in the same location or sends the sample to a lab for analysis. A urinalysis can rule out kidney problems or an infection.

Imaging Tests

The health care provider decides which test to order based on the symptoms, medical history, and physical exam.

Upper GI series. A health care provider may order an upper GI series to look at the upper GI tract. A radiologist—a doctor who specializes in medical imaging—performs this test at a hospital or an outpatient center. This test does not require anesthesia. The patient should not eat or drink for 8 hours before the procedure, if possible. During the procedure, the patient will stand or sit in front of an x-ray machine and drink barium, a chalky liquid. Infants lie on a table and a health care provider gives them barium through a tiny tube placed in the nose that runs into the stomach. Barium coats the GI tract, making signs of obstruction or other problems that can cause vomiting show up more clearly on x rays. A patient may experience bloating and nausea for a short time after the test. The upper GI series can show other problems that may be causing symptoms, such as an ulcer or obstruction.

Abdominal ultrasound. A health care provider may order an ultrasound to look at the organs in the abdomen. A technician uses a device, called a transducer, that bounces safe, painless sound waves off organs to create an image of their structure. The technician performs the procedure in a health care provider's office, an outpatient center, or a hospital. A radiologist interprets the images. A patient does not need anesthesia. The abdominal ultrasound can show other problems that may be causing symptoms, such as gallstones.

Upper Gastrointestinal Endoscopy

This procedure involves using an endoscope—a small, flexible tube with a light—to see the upper GI tract. A gastroenterologist—a doctor who specializes in digestive diseases—performs the test at a hospital or an outpatient center. A health care provider may give a patient a liquid anesthetic to gargle or may spray anesthetic on the back of the patient's throat. A nurse or technician will place an IV needle in a vein in the arm to administer sedation or anesthesia. Sedatives or anesthesia help a patient stay relaxed and comfortable. The gastroenterologist carefully inserts the endoscope into the mouth and feeds the endoscope down the esophagus and into the stomach and duodenum. A small camera

mounted on the endoscope transmits a video image to a monitor, allowing close examination of the intestinal lining. The upper GI endoscopy can show other problems that may be causing symptoms, such as an ulcer. A gastroenterologist may obtain a biopsy—a procedure that involves taking a small piece of tissue for examination with a microscope—of the small-intestinal lining during an upper GI endoscopy. The patient will not feel the biopsy.

Gastric Emptying Test

Also called gastric emptying scintigraphy, this test involves eating a bland meal—such as eggs or an egg substitute—that contains a small amount of radioactive material. A specially trained technician performs the test in a radiology center or hospital, and a radiologist interprets the results; the patient does not need anesthesia. An external camera scans the abdomen to show where the radioactive material is located. The radiologist is then able to measure the rate of gastric emptying at 1, 2, 3, and 4 hours after the meal.

How is cyclic vomiting syndrome treated?

A health care provider may refer patients to a gastroenterologist for treatment.

People with cyclic vomiting syndrome should get plenty of rest and take medications to prevent a vomiting episode, stop an episode in progress, speed up recovery, or relieve associated symptoms.

The health care team tailors treatment to the symptoms experienced during each of the four cyclic vomiting syndrome phases:

- **Prodrome phase treatment.** The goal during the prodrome phase is to stop an episode before it progresses. Taking medication early in the phase can help stop an episode from moving to the vomiting phase or becoming severe; however, people do not always realize an episode is coming. For example, a person may wake up in the morning and begin vomiting. A health care provider may recommend the following medications for both children and adults:
 - ondansetron (Zofran) or lorazepam (Ativan) for nausea
 - ibuprofen for abdominal pain
 - ranitidine (Zantac), lansoprazole (Prevacid), or omeprazole (Prilosec, Zegerid) to control stomach acid production
 - sumatriptan (Imitrex)—prescribed as a nasal spray, an injection, or a pill that dissolves under the tongue—for migraines
- **Vomiting phase treatment.** Once vomiting begins, people should call or see a health care provider as soon as possible. Treatment usually requires the person to stay in bed and sleep in a dark, quiet room. A health care provider may recommend the following for both children and adults:
 - medication for pain, nausea, and reducing stomach acid and anxiety
 - anti-migraine medications such as sumatriptan to stop symptoms of a migraine or possibly stop an episode in progress
 - hospitalization for severe nausea and vomiting
 - IV fluids and medications to prevent dehydration and treat symptoms
 - IV nutrition if an episode continues for several days
- **Recovery phase treatment.** During the recovery phase, drinking and eating will replace lost electrolytes. A person may need IV fluids for a period of time. Some people find their appetite returns to normal right away, while others start by drinking clear liquids and then moving slowly to other liquids and solid food. A health care provider may prescribe medications during the recovery phase and well phase to prevent future episodes.

- **Well phase treatment.** During the well phase, a health care provider may use medications to treat people whose episodes are frequent and long lasting in an effort to prevent or ease future episodes. A person may need to take a medication daily for 1 to 2 months before evaluating whether it helps prevent episodes. A health care provider may prescribe the following medications for both children and adults during the well phase to prevent cyclic vomiting syndrome episodes, lessen their severity, and reduce their frequency:
 - amitriptyline (Elavil)
 - propranolol (Inderal)
 - cyproheptadine (Periactin)

How can a person prevent cyclic vomiting syndrome?

A person should stay away from known triggers, especially during the well phase, as well as

- get adequate sleep to prevent exhaustion
- treat sinus problems or allergies
- seek help on reducing stress and anxiety
- avoid foods that trigger episodes or foods with additives

A health care provider may refer people with cyclic vomiting syndrome and anxiety to a stress management specialist for relaxation therapy or other treatments.

A health care provider may prescribe medications to prevent migraines for people with cyclic vomiting syndrome.

Eating, Diet, and Nutrition

During the prodrome and vomiting phases of cyclic vomiting syndrome, a person will generally take in little or no nutrition by mouth. During the recovery phase, the person may be quite hungry as soon as the vomiting stops. As eating resumes, a person or his or her family should watch for the return of nausea. In some cases, a person can start with clear liquids and proceed slowly to a regular diet.

During the well phase, a balanced diet and regular meals are important. People should avoid any trigger foods and foods with additives. Eating small, carbohydrate-containing snacks between meals, before exercise, and at bedtime may help prevent future attacks. A health care provider will assist with planning a return to a regular diet.

Points to Remember

- Cyclic vomiting syndrome, sometimes referred to as CVS, is an increasingly recognized disorder with sudden, repeated attacks—also called episodes—of severe nausea, vomiting, and physical exhaustion that occur with no apparent cause.
- The disorder can affect a person for months, years, or decades.
- The cause of cyclic vomiting syndrome is unknown.
- The severe vomiting and retching that define cyclic vomiting syndrome increase the chance of developing several complications, including dehydration, esophagitis, a Mallory-Weiss tear, and tooth decay.
- Intensity of symptoms will vary as a person cycles through four distinct phases of an episode.
- The main symptoms of cyclic vomiting syndrome are severe nausea and sudden vomiting lasting hours to days.
- People with cyclic vomiting syndrome should get plenty of rest and take medications to prevent a vomiting episode, stop an episode in progress, speed up recovery, or relieve associated symptoms.
- During the well phase, a balanced diet and regular meals are important. A health care provider will assist with planning a return to a regular diet.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases' (NIDDK's) Division of Digestive Diseases and Nutrition conducts and supports basic and clinical research into many digestive disorders, including cyclic vomiting syndrome.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at www.nih.gov/health/clinicaltrials. For information about current studies, visit www.ClinicalTrials.gov.

References

1. Hejazi, RA, McCallum RW. Review article: cyclic vomiting syndrome in adults—rediscovering and redefining an old entity. *Alimentary Pharmacology & Therapeutics*. 2011;34(3):263–273.
2. Drumm BR, Bourke B, Drummond J, et al. Cyclical vomiting syndrome in children: a prospective study. *Neurogastroenterology & Motility*. 2012;24(10):922–927.
3. Li B U.K., Lefevre F, Chelimsky GG, et al. North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition consensus statement on the diagnosis and management of cyclic vomiting syndrome. *Journal of Pediatric Gastroenterology and Nutrition*. 2008;47(3):379–393.

4. Functional gastroduodenal disorders.
In: Drossman D, ed. *Rome III: The Functional Gastrointestinal Disorders*. 3rd ed. McLean, VA: Degnon Associates, Inc.; 2006: 419–486.
5. Abell TL, Adams KA, Boles RG, et al. Cyclic vomiting syndrome in adults. *Neurogastroenterology & Motility*. 2008;20(4):269–284.

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