Emergency Medical Education: 20 Questions

20 Questions is a monthly educational resource developed for HCMC EMS paramedics and authored by their medical directors and other subject matter experts. This content is intended for educational purposes only and not intended to be a substitute for professional medical advice, diagnosis, or treatment.

20 Questions about Vomiting

Brought to you in anticipation of State Fair food!

1. What is the most common mis-diagnosis made when vomiting is present?
2. Why do we vomit? (anatomically, ie: not things that induce vomiting, eg: tequila)
3. What vital sign changes may accompany vomiting acutely?
4. If you are feeling nauseated and take some anti-nausea tablets, why do you often throw them back up?
5. When examining a patient with a history of vomiting blood, what non-GI system should you always check, or at least ask about?
6. You are called for a 14 year old vomiting blood. The patient has vomited a few times today without blood, but after prolonged retching he vomited uniformly bloody material. What is the most common cause of this patient's bleeding?
7. What other complications can vomiting itself lead to?
8. What are some key history components that you will want to ask?
9. What medication(s) are often prescribed for vomiting? What are some less typical medications that may work?
10. What is the most common side effect of some typical medications?
11. You are called for a 2 month old with vomiting at least 8 times in the past 8 hours. The mother states the baby won't feed. The child has moist mucous membranes, and cries large tears when you examine her. The child had a wet diaper within the past hour. Can this child be dehydrated?
12. Is this child a good candidate for anti-emetics?
13. What other metabolic abnormality should you be worried about in this child (that you can check in the field)?
14. What should you look for on physical exam?
15. Transporting the child from Deephaven, you have time to reflect on the most common GI causes of vomiting, which are…
16. En route, the patient vomits greenish-colored material. What might this indicate?
17. You are called for 'one sick' and arrive to find a 55 year-old male who appears pale and diaphoretic. Vital signs are normal except for tachycardia at about 110. He complains of

nausea, and feeling 'weak' but no other symptoms. He vomits as you walk in the room (no direct correlation). What are some things that could be wrong with him?
18. What is a common cause of recently developed, isolated, episodic vomiting in females?
19. What is a common cause of vomiting in heavy marijuana users?
20. What is a common cause for true 'projectile vomiting' in infants (aside from possession of their body by the devil)?

20 Answers About Vomiting

1. **Gastroenteritis.** This diagnosis cannot be made without significant diarrhea being present, and when no other explanation for the symptoms is likely.
2. **The brain has a 'vomiting center' in the brainstem.** It is adjacent to the centers for salivation and respiration. This is the coordinating center for vomiting, which is stimulated by input from the vagus nerve and chemoreceptor trigger zone (an area near the vomiting center which receives stimulation from chemicals and other substances in the blood), as well as other special sense areas (e.g. your nose).
3. **Because vagal nerve stimulation accompanies vomiting (and may help cause it as well), bradycardia and occasionally hypotension may be produced.** This response can be blocked or corrected with atropine. Generally, the more unstable a patient is, the more likely that bad hemodynamic things will occur when they say 'I'm going to throw up'.
4. **When you are nauseated, your body has already begun preparations to throw up in that the pylorus (exit out of the stomach) is constricted and fluid absorption from the stomach is reduced.** Most drugs are thus poorly absorbed orally when nausea is present (because they can't get to the small bowel, where they are usually absorbed by the body). This is why dissolvable Zofran is nice and generally should not be swallowed but allowed to dissolve in the mouth. Also, the additional stimulation of the medicine and fluid may cause vomiting.

5. **The nose and mouth.** Oral, but especially nasal bleeding with swallowed blood is a common cause of hematemesis, (and also easily corrected).
6. **A tear of the esophageal mucosa (Mallory-Weiss tear) may be produced with vomiting.** It may occur on the first retch, or after many episodes. These tears almost always heal on their own. Obviously, other causes will need to be considered as well, but with this history such a tear is likely. It does not explain why the child was vomiting in the first place.
7. **Esophageal rupture (often fatal) can occur (Boerhaave's syndrome), and metabolic disturbances including low potassium and metabolic alkalosis can occur.** Gastric rupture is very rare. Dehydration is a common complication. It can lead to metabolic acidosis and other electrolyte problems.
8. **Frequency, onset, relation to food, and associated symptoms such as pain, fever, jaundice, and diarrhea are helpful.** Medications, menstrual history, underlying disease (e.g. diabetes, renal failure), and past medical history (e.g. pancreatitis) may provide clues. Ask about non-GI symptoms like headache, chest pain, dyspnea, and drug use. Surgical history may also be helpful, especially if obstruction is suspected.

9. **Zofran (ondansetron) is the most common agent as it has minor side effects and works well.** Dissolving tablets, tablets, and liquid form are available in addition to injectable. Compazine tablets and suppositories, and Reglan tablets are also used. Doxylamine/B6 is commonly used in pregnancy as the first line treatment.
10. **Akasthisia (feeling restless) may occur fairly frequently after Compazine, Reglan, and other anti-emetics (probably about 15% of the time, though some studies have found even higher rates).** Dystonic reactions (stiffness or incoordination, especially of the neck, mouth, and sometimes eye muscles) are more rare. Both are treated with diphenhydramine (Benadryl). Zofran does not cause akasthisia but can cause diarrhea and headache, as well as prolong the QT slightly. Phenergan is sometimes used in children and can cause severe sleepiness.
11. **Unfortunately, yes. Infants have poor ability concentrate their urine, so that urine output under a year of age is not a reliable indicator.** Tears and mucous membrane findings may be helpful if they are abnormal, but are not helpful if normal. In this age group, you primarily have to rely on the history (however accurate) to decide how concerned to be (unless the child looks sick, in which case the history doesn't matter much).
12. **No. Unfortunately, children tend to have a much higher rate of adverse reactions to most anti-emetics.** They also don't get nearly as much benefit from them. It's been suggested that vomiting in young children may be triggered in a slightly different fashion then in adults, perhaps explaining why these meds don't work as well. Generally at this age, all you can do is try slow, frequent oral hydration (5ml every 5minutes) and if that fails, put an IV in… Zofran can be used starting about 3 months of age.

13. **Glucose!** The younger the child (especially under age two) the more likely that significant vomiting (and poor intake) will lead to hypoglycemia. Not infrequently, these children may look very good despite sugars in the 50s. You should always check a glucose on any child with altered behavior or mental status who has had fluid losses (eg: vomiting or diarrhea, hemorrhage). In addition, you may also find severe hyperglycemia, as children often present with vomiting as one of the only initial symptoms of their first presentation of DKA.
14. **Abdominal distension and tympany (drum or hollow sound when percussed) may suggest obstruction.** Abdominal tenderness may suggest multiple possibilities, depending on location. Masses in the abdomen may suggest pregnancy, malignancy, etc. Look at the vital signs and check for signs of dehydration. Also note the neuro exam. Listen to their speech, watch their coordination, and check their eyes; often good enough to determine if you have more to fear.
15. **In infants, malrotation with volvulus is a life-threatening situation in which part of the gut twists on itself.** (Volvulus – twisting - can happen to other parts of the bowel later in life as well). Pyloric stenosis, incarcerated hernia, gastroenteritis, peptic disease, ingestion (especially certain plants, aspirin, theophylline, etc.), severe reflux, Hirschsprung's disease (problem with passing stool), and intussusception are also common in kids. In adults look for some of the above plus. pancreatitis, small bowel obstruction, appendicitis, and gallstones.
16. **Bile-stained vomit often indicates obstruction.** In an infant, this should be considered to be a life-threatening situation because the causes of obstruction (volvulus, intussusception, etc.) need to be treated quickly, or death can result. So if baby throws up bile, time to pack up

for the ER. Bile-staining in adults is somewhat less concerning, but still is more ominous then just vomiting stomach contents.

17. **Highest on your list should be cardiac ischemia.** The vagal stimulation from cardiac ischemia may produce the only 'symptoms'. Other possibilities are lower lobe pneumonia, early sepsis or meningitis, AAA rupture, intestinal ischemia, aortic dissection (usually painful, but not always), DKA, toxic, testicular torsion, renal stone, inner ear infection with vertigo, and ischemic stroke or CNS bleed.
18. **Pregnancy.** Pyelonephritis and ectopic pregnancy, ovarian torsion or ovarian cyst rupture are other relatively common causes of vomiting (the latter three usually very sudden in onset and often severe) in females of child-bearing age. In children younger than 2 years (particularly females), UTI is a common cause of unexplained vomiting.

19. **Marijuana cyclic vomiting syndrome is recurrent vomiting and abdominal pain which occurs in chronic users (there are other cyclic vomiting syndromes which are not THC-related also).** Interestingly, hot baths help the symptoms and this is usually well-known by the users, but sometimes they need medical attention due to dehydration and electrolyte imbalances.
20. **Pyloric stenosis, which is hypertrophy of the muscle that allows exit from the stomach to the small bowel, classically presents within the first few months of life.**Usually the child has had frequent episodes of forceful vomiting which occur after feeding. Often the distance traveled is impressive! (Don't forget your barrier precautions).