

The Vomiting Dog and Cat: An ER Perspective



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The vomiting patient is among the top three clinical reasons families bring their pets to see the veterinarian.¹ As such, explaining a basic workup from an ER veterinarian's perspective is helpful so that a client can understand why certain diagnostic tests and treatments are offered to manage the vomiting patient.

Vomiting is a fairly non-specific symptom, and causes can be broken down into two major subcategories: causes of vomiting that come from INSIDE the gastrointestinal system versus causes of vomiting that originate from OUTSIDE the gastrointestinal system.

From INSIDE the gastrointestinal system, common causes of vomiting include (but are limited to) gastroenteritis (like food poisoning or having a stomach flu), mechanical obstruction (i.e., from an object lodged in the GI tract), and parasites like a giardia infection. Examples of other causes include flare-ups of chronic enteropathies such as Inflammatory Bowel Disease, gastrointestinal cancer, etc.

From OUTSIDE the gastrointestinal system, examples of problems that can cause vomiting include (but are not limited to) acute kidney injury, acute liver injury, hypoadrenocorticism (Addison's Disease, which is a chronic hormonal deficiency), pancreatitis, etc.

Ruling out potential causes and narrowing down the list of possibilities involves collecting a detailed history from the client, performing a thorough physical examination, and utilizing additional diagnostic tests.

Signalment and History

From an ER perspective, the patient's signalment (identity) and medical history help prioritize the list of differential diagnoses.

For example, the patient's history can help answer questions on chronicity versus acuteness. Some dogs/cats have chronic problems of vomiting (such as the dog who has been vomiting twice weekly for six months and may have underlying Inflammatory Bowel Disease) versus an acute problem, such as the 8-



week-old puppy who is infected with canine parvovirus and is critically ill. Some families will report that they recently changed a pet's food without a transition protocol, which helps explain some cases of vomiting. Other families may report a recent history of kenneling the dog at a boarding facility with an outbreak of giardia. Other cases may involve reports of known ingestion of toxins such as chocolate, rat poison, or other noxious compounds. We use the history to help narrow the list of differentials and guide diagnostic tests and treatments.

Physical Exam



Cat with hair ties in stomach – later successfully removed via endoscopy.

The physical exam tends to be fairly non-specific for most vomiting patients. Individual findings on physical exams can help establish levels of concern to create a holistic clinical picture of the patient before making a diagnosis and recommendation.

For example, an elevated body temperature may suggest the presence of pneumonia secondary to accidentally inhaling vomit;

however, a pet may have an elevated body temperature from being overly excited/anxious and trembling in the exam room. Yellowing of the skin and eyes may indicate excess bilirubin in the bloodstream from liver dysfunction, rapid destruction of red blood cells, or obstruction of the biliary system. Dry/tacky gums and reduced skin elasticity may indicate significant dehydration due to vomiting and nausea. Acute abdominal pain can be a marker of something mild (like a mild case of gastroenteritis or pancreatitis) or something life-threatening (like a ruptured spleen or a mechanical obstruction of the intestines). In rare cases, diagnosing the problem outright on physical exam is possible. These cases include finding a linear foreign body, such as a string, lodged around the patient's tongue with the trailing end descending into the stomach and intestines, leading to a mechanical obstruction. You can sometimes even feel a large foreign object, such as a toy or corncob, within the intestines of some patients; however, caution must be taken from OVER-interpreting a physical exam. The "foreign object" you think you are feeling in the intestines may just be feces.

As such, the physical exam should not be relied upon solely to make the final diagnosis for the patient, and the focus should be directed toward gathering more clinical data to guide the prioritization of diagnostic testing.

Diagnostic Tests

Thousands of diagnostic tests are available to test for thousands of different diseases. It is helpful to break down tests into two major categories: lab work and imaging. Lab work (testing blood and/or urine) typically helps investigate for causes of vomiting that start from outside the gastrointestinal tract. For

example, a common test would be a serum chemistry panel, which may return results reflecting the health/function of the kidneys, liver, blood sugar, electrolytes, and other important markers. This blood test can help screen for injury/dysfunction with those organs that may be contributing to the pet's nausea and vomiting; however, it is important to note that one cannot assume that irregularities found on lab work are the primary CAUSE of the patient's illness.

In some cases, liver/kidney dysfunction on lab work may be a manifestation/result of some other underlying disease process, and this reflects a chicken-vs-the-egg problem of knowing which issue came first. Other common laboratory tests to perform would include pancreatic lipase screening, complete blood count, baseline cortisol testing, etc. There are thousands of available lab tests, and the clinician uses the patient's history and physical examination to help prioritize which test would be the highest-yielding vs. which tests would be low-yield (rather than submitting every possible lab test). The serum chemistry panel tends to be the highest-yielding for its price point when investigating problems with the vomiting patient. It helps rule out significant liver/kidney dysfunction or severe electrolyte changes that could be contributing to the patient's nausea. Essentially, it helps rule out *some* "emergency" or "critical" causes of illness.

The other category of diagnostic tests involves diagnostic imaging. Numerous imaging modalities span from radiographs (using x-ray radiation to create 2D images), abdominal ultrasound, CT, fluoroscopy, MRI, etc. For most basic cases of vomiting, a routine screening tool with good yield and a relatively low price point would be the radiograph. For the vomiting patient, imaging



Linear foreign body causing plication and obstruction of the intestines (surgical emergency).

aims to answer two important questions: (1) is there something foreign that doesn't belong in the GI tract? (2) Is there evidence of a mechanical obstruction requiring surgery? Occasionally, we may find other things on radiographs, such as an abdominal tumor, bladder stones, etc. That being said, radiographs do not provide the answer 100% of the time, and it is not uncommon to escalate to more advanced testing if we cannot achieve an answer on radiographs alone. In one study of vomiting dogs with concerns of a mechanical obstruction from a foreign body, radiography produced a definitive result in 70% of dogs (58/82). In contrast, ultrasonography produced a definitive result in 97% of dogs (80/82).² Each diagnostic test has its own pros/cons based on both logistical availability and the physics underpinning each modality. For example, a set of abdominal radiographs may cost \$400 and is readily available, whereas an ultrasound may cost \$800 and require an appointment due to limited availability.

Treatment

Treatment and prognosis of the vomiting patient will ultimately depend on the underlying diagnosis based on the diagnostic tests mentioned above. Hospitalization with more advanced diagnostic tests would be warranted if lab work returned with significant dysfunction of the liver, kidneys, pancreas, or electrolytes.



Surgery would likely be warranted if a mechanical obstruction was diagnosed on abdominal imaging. In the best case scenario, all diagnostic tests return NORMAL with NO EVIDENCE of liver dysfunction, kidney dysfunction, severe electrolyte changes, severe pancreatic enzyme elevation, or surgical obstruction of the gastrointestinal tract. In these cases, the most common cause is gastroenteritis, which is generally manageable on an outpatient basis. Outpatient treatment typically involves an injection of fluids as well as an anti-nausea drug such as Cerenia (maropitant) to pharmacologically block the vomiting for approximately 24 hours. This simple protocol is usually sufficient for the majority of patients suffering from something mild, such as gastroenteritis. No diagnostic tests are 100% predictive of a given

problem, and further escalation to more advanced testing and possible hospitalization would be recommended if the patient FAILS outpatient therapy (vomiting, lethargy, and anorexia despite injections of fluids and anti-nausea medication).

References

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