Why so many vomiting cats? Getting the diagnosis

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Vomiting is the active expulsion of stomach and sometimes duodenal contents and is typically preceded by nausea and retching. Vomiting is a clinical sign, not a diagnosis, and should be approached as such. Chronic vomiting is a very common clinical sign in cats and can be associated with a wide variety of disorders, both gastrointestinal and non-gastrointestinal. It is important to differentiate between vomiting and regurgitation in order to avoid unnecessary tests. Four main pathways stimulate the vomiting centre in the medulla:

1) Peripheral sensory receptors
   a. Intra-abdominal
      i. Stomach, intestines, pancreas, liver, peritoneum, kidneys, bladder
      ii. Visceral afferent fibres in sympathetic and vagal nerves
   b. Heart and large vessels, via vagus nerve
   c. Pharynx, via glossopharyngeal nerve

2) Stimulation of the chemoreceptor trigger zone
   a. Uremia
   b. Electrolyte imbalances
   c. Bacterial toxins
   d. Drugs

3) Vestibular input
   a. Inflammatory disorders
   b. Motion sickness, via acoustic nerve

4) Higher central nervous system centres
   a. Psychogenic, e.g., fear, stress, excitement via catecholamine release
   b. Inflammatory CNS lesions

Therefore, evaluation of the vomiting cat requires consideration of the whole animal (not just the GI tract) and a logical diagnostic approach. Some common causes of vomiting in cats include:

1) Gastrointestinal disease
   a. Infectious disease: bacterial (e.g., Helicobacter, Salmonella), viral
   b. Parasites: Giardia, Ollulanus, ascarids
   c. Obstruction: foreign body, intussusception
   d. Neoplasia: e.g., lymphoma
   e. Inflammation: e.g., gastritis, inflammatory bowel disease
   f. Dietary: food intolerance, food allergy, dietary indiscretion

2) Non-gastrointestinal disease
   a. Metabolic, systemic: e.g., heartworm, renal disease, hyperthyroidism, diabetic ketoacidosis, urethral obstruction, hepatic disease, pancreatitis, peritonitis, electrolyte imbalance, cholangitis
   b. Toxins, drugs: chemotherapy drugs, NSAIDs, antibiotics, plants (e.g., lily), ethylene glycol, and others
   c. Neurological: e.g., vestibular disease, motion sickness

So what about hairballs? Ingestion of hair routinely occurs in cats due to their barbed tongues and fastidious grooming habits. In most cases, undigested hair is passed in the feces. Hair can accumulate in the stomach because cats lack interdigestive migrating myoelectric complexes that clear non-digestible material from the stomach of other species. Occasional vomiting of hair is thus considered normal in cats and can occur in both longhair and shorthair cats. Control measures for hairballs include regular grooming (which may include clipping the hair coat of longhair cats), semi-solid petroleum-based laxatives, special purpose commercial diets, and flea control. Cats with chronic persistent hairballs despite control measures may benefit from a prokinetic drug such as cisapride, but should be evaluated for underlying disease as ingestion of hair is not always benign. There are cases in the literature where hairballs have been associated with serious disease in
cats, such as gastric, intestinal, or esophageal obstruction. Hairballs may also be associated with constipation or colitis. Predisposing factors may include long hair coat, pruritic skin disease (e.g., flea allergy dermatitis), and pre-existing intestinal disease that affects motility (e.g., inflammatory bowel disease).

The signalment and clinical history for vomiting cats must be detailed and complete to determine differential diagnoses and guide diagnostic testing and therapeutics. The following areas should be considered:

1. **Signalment**: younger cats are more likely to ingest foreign bodies, older cats are more likely to have systemic disease
2. **Diet**: current diet, recent changes, ‘table’ food, supplements, hunting
3. **Environment**: plants, potential foreign bodies, toxins
4. **Duration and frequency**: acute (<7 days) versus chronic, severity
5. **Relationship to eating**: >8 hours after eating implies gastric outlet obstruction or motility disorder; no relationship to eating implies systemic disease
6. **Vomiting process**: distinguish vomiting from regurgitation
7. **Vomitus**: presence of blood (gastric mucosal damage), bile (reflux from small intestine), parasites (e.g., *Ollulanus tricuspis*), food (state of digestion), hair
8. **Deworming history**
9. **Previous illnesses**
10. **Current medications**
11. **Other changes**: anorexia, polydipsia/polyuria, diarrhea, weight loss, etc. (may imply a systemic disorder)

The most common type of vomiting is acute gastroenteritis. This is typically self-limiting and seen in patients that are otherwise well. Treatment may include withholding food for 24 hours to reduce stimulation of the gastric and intestinal mucosa. Once clinical signs have resolved, small portions of a highly digestible, high protein, low carbohydrate diet are fed for 2 to 3 days. Supportive care, such as fluid therapy or anti-emetics (Table 1), can be provided as necessary.

Some vomiting cats will require surgical intervention and this should be determined as soon as possible. Indications for surgical intervention include:

1. **History of foreign body ingestion with evidence of obstruction**
2. **Palpation of intussusception, foreign body, intestinal plication**
3. **Projectile vomiting with metabolic alkalosis and evidence of obstruction**
4. **Radiographic changes that include evidence of intussusception or foreign body, free gas within the peritoneum, intestinal plication, ground glass appearance (septic peritonitis), urinary tract rupture**

Cats with chronic vomiting should be evaluated initially with a minimum database (Figure 1). Many patients will benefit from a full GI panel as well (fPLI, fTLI, cobalamin, folate). Problems such as dehydration should be corrected. Hydroxycobalamin is used to treat cobalamin deficiency at 250 mcg/cat SC once weekly for 6 weeks, then once monthly for 1 or 2 injections. Serum cobalamin should be evaluated 1 month later. Imaging is indicated unless the cause of the vomiting is readily apparent. Plain radiographs are used to identify foreign bodies, gastric size and position, liver and kidney size, abdominal masses, ileus, etc. The most common cause of chronic intermittent vomiting in the cat is food intolerance (non-immunologic reaction to preservatives or colorings) or allergy (immunologic reaction to a protein antigen). Most of these patients are otherwise healthy and have little or no weight loss. The minimum database will be normal or have minimal changes. Removal of the offending food agent will result in prompt improvement in cats with food intolerance. Food allergies may require several weeks of therapy with a hypoallergenic, highly digestible diet to resolve.

Cats with significant or severe disease (persistent vomiting, hematemesis, weight loss, etc.) require more in-depth evaluation. Contrast radiography may be required for detecting gastric masses, foreign bodies, size and shape of stomach, size of liver, etc. A negative contrast gastrogram is easily performed with simple equipment. With the patient under anesthesia and intubated, a stomach tube is passed and air (5 mL/lb) is used to distend the stomach. An insufflator or a syringe and 3-way stop cock can be used to inject the air. As soon as the stomach is distended, the radiograph is taken. Ultrasonography is more sensitive than radiography for examining masses, intestinal mural thickness, mesenteric lymphadenopathy and full evaluation of the
pancreas, liver, and kidneys. Intussusception, non-radiopaque and linear foreign bodies can sometimes be observed. More advanced investigations may include endoscopy or exploratory surgery.

**Recommended reading**


**Table 1**: Common antiemetic drugs used to treat vomiting in cats

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Metoclopramide</td>
<td>0.2 – 0.4 mg/kg SC, PO q 8hr</td>
<td>Also prokinetic</td>
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<tr>
<td></td>
<td>1 – 2 mg/kg/day CRI</td>
<td>Centrally acting?</td>
</tr>
<tr>
<td>Dolasetron</td>
<td>0.5 - 1 mg/kg IV, PO q 24 hrs</td>
<td>5-HT3 receptor antagonists</td>
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<tr>
<td>Ondansetron</td>
<td>0.5 mg/kg PO q 12 hrs</td>
<td>Expensive</td>
</tr>
<tr>
<td>Maropitant</td>
<td>1 mg/kg IV, SC, PO q 24 hrs (up to 5 days)</td>
<td>Inhibits substance P binding to NK-1 receptors</td>
</tr>
<tr>
<td>Phenothiazines: prochlorperazine chlorpromazine</td>
<td>0.1 – 0.5 mg/kg SC q 8hr</td>
<td>Centrally acting via multiple mechanisms</td>
</tr>
<tr>
<td>Mirtazapine</td>
<td>1.9 – 3.75 mg/cat PO q 48 hrs</td>
<td>5-HT3 receptor antagonist</td>
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<td></td>
<td>Often given as ¼ of 15 mg tablet</td>
<td>Appetite stimulant</td>
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<td>Reduce by 30% in hepatic or renal impairment</td>
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**Figure 1**: Summary of diagnostic steps for investigation of vomiting in cats

**Vomiting**

- **Acute, otherwise well**
  - If no abnormalities on physical exam:
    - Broad-spectrum deworming (e.g., fenbendazole)
    - Symptomatic therapy

- **Unwell or Chronic**
  - If persistent, follow plan for unwell cats
  - CBC, serum chemistries, urinalysis, FeLV/FIV, +/- total T4

  - Imaging (radiographs, ultrasound)

  - Advanced testing
    - Cobalamin, folate
    - fPLI, fTLI

  - Biopsy samples (exploratory laparotomy, laparoscopy, endoscopy)