Approach to the management of vomiting in cats

Current guidelines to ‘best practice’ from the European Emesis Council

Supported by Pfizer Animal Health
The European Emesis Council is committed to building and developing best practice in the management of canine and feline vomiting, nausea and associated causes.

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Introduction

Vomiting is a common presenting complaint in feline practice and occurs in an enormous range of disease processes. It is amongst the most common disorders reported for cats examined in private veterinary practices. Here, the European Emesis Council presents recommendations for the investigation and management of vomiting in cats, which are based on a review of published evidence and expert opinion.

The emetic reflex and causes of vomiting

Vomiting in cats is a complex coordinated reflex, resulting in expulsion of gastric contents, coordinated by neurons distributed in the brainstem. These neurons can be triggered by peripheral stimuli, from the gastrointestinal tract or other visceral organs, or central stimuli, such as space-occupying lesions and centrally-acting circulating toxins. Vestibular stimuli (motion sickness) can also cause vomiting in cats, although, as in other species, susceptibility varies between individuals. Input from midbrain or forebrain structures also may trigger vomiting.

Causes of acute vomiting

In cats, acute vomiting may be commonly associated with expulsion of hairballs, adverse reactions to diet or drugs, houseplant ingestion, infectious agents such as feline panleukopenia virus, and acute self-limiting emesis of undetermined cause (so-called “acute gastritis”). Cats presented for vomiting as the primary complaint are more likely than dogs to require treatment and investigation. This is because cats are less likely to have self-limiting vomiting, are more likely to be dehydrated (due to their size), and have more risk of anorexia and subsequent lipidosis. The initial assessment should determine the severity of the disease process. This will differentiate those cats that need limited further examination and can be treated symptomatically, and those that also need more extended further investigation or specific treatment. Examples of the latter are: cats with suspected gastrointestinal obstruction, foreign bodies or septic peritonitis, or cats that are dehydrated.

Causes of chronic vomiting

Common causes of chronic vomiting in cats include inflammatory bowel disease, chronic pancreatitis, adverse reactions to food, liver disease, hyperthyroidism and end-stage chronic kidney disease. However, many other conditions have been reported to be associated with vomiting in cats. The initial assessment may give indications of the underlying cause of the vomiting. It must clarify which further investigations and, subsequently, which specific treatments are indicated.
Clinical presentation and initial assessment

Assessment starts with the age, breed and gender of the cat, along with determining signs in other cats in the household. Age is important because some diseases are more common in young cats, such as ingestion of foreign bodies, intussusception, or infectious diseases such as panleukopenia virus, parasites or coronavirus enteritis; while other diseases such as hyperthyroidism, chronic kidney disease or gastrointestinal or hepatobiliary neoplasia are more common in older cats. Breed is an important consideration (e.g. Siamese cats are predisposed to gastrointestinal adenocarcinoma). Some disorders can only affect one gender.

A complete history is essential for evaluation of a vomiting cat. Information, which should be obtained during the initial assessment, includes:

- Distinguish vomiting from regurgitation (is there abdominal effort involved?)
- Onset and progression of signs
- Description of the vomit
- Haematemesis
- Timing related to eating
- Concurrent constipation and tenesmus
- Presence of diarrhoea, haematochezia, melaena
- Appetite, nutritional status and weight loss
- Fluid intake (increased, decreased, or normal)
- Micturition behaviour (including dysuria, anuria)
- Presence of abdominal pain
- Diet changes, recent drug therapy, access to toxins or foreign bodies
- Vaccination status
- Concurrent dermatological signs
- Ptyalism and depression
- Normal living environment
- Hormonal treatment for oestrus prevention
- Vaginal bleeding, vulvar discharge
**Physical examination**

This should include assessment of the following features:

- Abdominal palpation (abdominal tenderness or distension/effusion, masses)
- Rectal temperature (hypothermia, fever)
- Oral examination (presence of foreign bodies, including under the tongue), inspection of anus
- Colour of mucous membranes (pale, icteric)
- Heart frequency, auscultation
- Skin turgor
- Behaviour (depression)
- Respiration (dyspnoea)
- Size of the bladder
- Lymph node enlargement
- Palpation of cervical area
- Nasal discharge
- Vaginal discharge
- Neurological examination

**Criteria for further examination**

From the signalment, history and physical examination, the clinician should be able to categorise the patient as minimally unwell (generally stable cat with no criteria for further assessment or treatment) or unwell (unstable cat with one or more criteria for intervention), establish a problem list, and identify appropriate diagnostic investigations and treatment. Cats with simple, mild, acute self-limiting emesis do not need further investigation, and can be treated symptomatically or simply monitored. In such cases, signs typically resolve after 1-2 days, with or without symptomatic and supportive therapy. Suggested criteria, whereby further assessment and management should strongly be considered when identified in a vomiting cat, include:

- Vomiting that is:
  - frequent and acute
  - in large volumes
  - of a foetid nature or containing blood
- Melaena
- Abnormal abdominal palpation
- Abdominal pain
- Abdominal swelling or free fluid
- Weight loss/failure to thrive
- Fever
- Severe dehydration/hypovolaemia
- Hypothermia/shock
- Polyuria/polydipsia
- Bradycardia (absolute or relative to volume status)
- Marked malaise (dullness, depression, lethargy)
◆ Other abnormal physical examination findings, such as pale mucous membranes, jaundice, neurological signs, dysrhythmias, palpably enlarged thyroid, enlarged lymph nodes, vaginal discharge
◆ Chronicity (>2 weeks duration)
◆ Failure of symptomatic treatment

**Diagnostic approach**

If signs of dehydration, shock, or hypothermia are present, the cat should be treated with intravenous fluid resuscitation, and further examinations should include haematological examination, a biochemistry profile and urinalysis. If no abnormalities are discovered on abdominal palpation, it is appropriate to await the results of haematological examination, biochemistry profile and urinalysis. Total T4 measurement should be considered in cats >6 years old.

Thoracic radiographs are indicated if the cat is coughing, is dyspnoeic, tachypnoeic, has abnormalities on auscultation, has an abnormally empty abdomen on palpation, or if there is a suspicion of oesophageal disease based on the presenting history. Diagnostic imaging of the abdomen should be considered in a vomiting cat, especially if abnormalities are found on abdominal palpation (e.g. abdominal pain, mass, thickened intestines). Ultrasonography is the most appropriate imaging modality in many cases, but the information obtained is often complementary to the findings of radiography. Contrast radiography, endoscopy, exploratory coeliotomy, or laparoscopy may also be considered. If the cat is icteric, ultrasonography (with liver fine needle aspiration cytology, biopsy and/or cholecystocentesis) is always warranted.

There are numerous causes of gastrointestinal obstruction in companion animals, but several are more commonly seen in cats, namely: linear foreign bodies, hairballs, focal intestinal neoplasia, and megacolon. When diagnostic imaging findings suggest obstruction, exploratory coeliotomy should be performed, or, in case of megacolon, the colon needs to be emptied under anaesthesia.

In those cases where further investigation is considered necessary or abnormalities are identified on initial diagnostic tests, a variety of other diagnostic tests may be indicated. Additional tests to be considered include an elimination diet trial, other blood tests (e.g. trypsin-like immunoreactivity, pancreatic lipase immunoreactivity, folate and cobalamin, lactate, coagulation tests), serology (e.g. testing for feline leukaemia virus and feline immunodeficiency virus), faecal examinations (e.g. flotation), tests for *Trichomonas foetus*, panleukopenia virus testing, examination of the vomit, analysis of peritoneal or thoracic effusion (such as cytology and culture), fine needle aspiration cytology of any abnormal organs or masses found, testing for heartworm infection (in endemic areas), endoscopy, and advanced imaging. Endoscopy can be used to examine the alimentary tract directly and to collect biopsies for histopathology. It is less invasive than exploratory coeliotomy.

**Symptomatic treatment**

Vomiting is unpleasant for cats and is distressing to owners, and can be associated with adverse consequences, including anorexia, weight loss, food aversion and disturbances of fluid, acid-base and electrolyte balance. It may also lead to aspiration pneumonia in dysphagic or severely debilitated cats. Pending results of investigations, supportive care for the vomiting cat can include fluid and electrolyte therapy, and antiemetics. In some cases antiemetics may be contraindicated, for example where gastrointestinal obstruction is suspected. Other urgent interventions may be required, depending on the clinical situation.
**Antiemetic treatment**

The most effective antiemetics for cats appear to be those that work via NK$_1$, or 5HT$_3$ receptors. Although often listed as a first line antiemetic, the D$_2$ antagonist metoclopramide is of questionable use as a central antiemetic in cats. Metoclopramide may be advantageous when a gastrointestinal prokinetic action is desired, e.g. for ileus or delayed gastric emptying. But also the prokinetic effect of metoclopramide in cats is questionable.

For the prevention of motion sickness related vomiting in cats, NK$_1$ receptor antagonists (e.g. maropitant) are known to be effective in the laboratory setting. However, unlike in dogs, maropitant is currently not authorised for the prevention of motion sickness related vomiting in cats. Antihistamines are thought to be effective against motion sickness in some species, but in cats H$_1$ antagonists do not seem to prevent motion sickness. Maropitant is also effective in the treatment and prevention of emesis and the reduction of nausea in cats due to central acting emetics such as the alpha-2 adrenergic agonist xylazine.

**Dietary management**

Many vomiting cats are systemically well and have self-limiting conditions. Dietary recommendations for this group have little scientific basis. Nonetheless, the self-limiting nature of clinical signs in these cases, and absence of evidence to the contrary, mean that these practices will likely continue for the current time. The standard dietary recommendation for cats with acute gastrointestinal disorders is to withhold food for 24 hours, followed by administration of small quantities of a bland, highly digestible diet three or four times per day for 3–7 days. Such short-term fasting is said to provide “bowel rest”, thereby reducing gastrointestinal secretions and bacterial numbers, whilst avoiding the adverse effects of non-absorbed, osmotically-active food particles. Arguably, the bowel can also be “rested” if a highly digestible diet is fed, since this is rapidly assimilated in the proximal small bowel. Nevertheless, continuing to feed may exacerbate vomiting and diarrhoea (if present). For these reasons, withholding of food is likely to remain as the most widely adopted strategy. Care must be taken when withholding food in kittens and also in sick cats, especially if they are obese, given concerns over invoking hepatic lipidosis. There is no direct evidence to support or refute the use of early enteral feeding in acutely vomiting cats that are managed as outpatients.

The term “bland diet” is commonly used but rarely defined. Most canned foods are arguably “bland” because of their taste and easy assimilation, whilst dry foods may be less suitable. There is little evidence to advocate switching to a diet containing a novel protein source. The feline stomach is less distensible than that of other species because their alimentary tracts are adapted to small, frequent, meals. A moderately energy dense, low fibre, wet (or liquid) diet should be used in small meals frequently. If an adverse reaction to food is suspected to be the cause of chronic gastrointestinal signs, a diet based on novel ingredients is fed. A hydrolysed protein diet can also be considered in these cases.

In contrast to stable acute vomiting cases with self-limiting disease, nutritional requirements for hospitalised cats are different, and withholding food is not usually recommended and the use of early enteral feeding should be considered. Enteral nutrition would also be favoured in cats with severe acute pancreatitis.

* Maropitant is an NK$_1$ receptor antagonist. Ondansetron is a drug working via 5HT$_3$ receptors, but is not licensed for veterinary use in the EU.
Monitoring

For monitoring, use techniques appropriate to the underlying disease including: frequent clinical assessment during hospitalization (especially post-operatively), laboratory investigations, indirect blood pressure measurement, and diagnostic imaging.

Time-frame for reassessment:

When symptomatic treatment is administered to a cat with suspected self-limiting disease, initial antiemetic treatment for 24 hours is appropriate. If vomiting has continued, other signs have not improved, or new signs are evident (e.g. deterioration in appetite, or general demeanour, or appearance of diarrhoea), reassessment should occur no more than 48 hours after the first visit. Owners should be warned that the use of antiemetic drugs could mask signs of vomiting associated with an underlying disease and they should be asked to return sooner if there is no improvement, if vomiting relapses after initial improvement or if there is any clinical deterioration. Other clinical signs suggestive of an underlying disease (e.g. anorexia, lethargy, fever, abdominal pain, etc.) would not be masked and should be carefully looked for. At revisit, the cat should be reassessed for signs that indicate further investigation or management and further treatment which should be performed as appropriate.

Vomiting in cats with cancer

Cats with benign or malignant tumours may be vomiting because of the presence of the tumour (e.g. in the alimentary tract, in the hepatobiliary system, affecting the pancreas) or because of paraneoplastic effects. Cancer chemotherapy is also associated with nausea and vomiting in cats, and can lead to adverse consequences including anorexia. Some chemotherapeutic drugs are more likely to cause vomiting than others, for instance: cyclophosphamide, ifosfamide (vomiting is mild and self-limiting), doxorubicin, methotrexate, mitoxantrone, idarubicin, chlorambucil, piroxicam, and vincristine. Responsible cancer chemotherapy is performed only when there are appropriate skills, experience and facilities. Anti-emetic and anti-nausea treatment forms an important part of responsible cancer chemotherapy management where vomiting and nausea are anticipated or recognised side effects of treatment.

References

Acute or chronic (>3 weeks) vomiting?

Acute vomiting

1. Common causes of acute vomiting
   - Acute self-limiting emesis
     - Adverse reactions to diet, hairballs, grass etc.
   - Infectious agents e.g. panleukopenia virus, parasites, coronavirus enteritis
   - Feline acute haemorrhagic vomiting syndrome

2. Important considerations in acute vomiting
   - Severity
   - Dehydration
   - Urethral obstruction?

If signs of shock, dehydration, or hypothermia are present
   - IV fluid therapy
   - Haematological examination
   - Urgent biochemistry profile
   - Urinalysis

FLUTD signs?
   - Catheterization
   - Biochemistry profile
   - Urinalysis
   - Abdominal ultrasonography

3. Other important causes to consider in acute vomiting
   - Oesophageal obstruction (difference between regurgitation and vomiting in cats not always clear)
   - Intestinal obstruction
   - Pancreatitis
   - Foreign bodies
   - Septic peritonitis
     - Linear foreign bodies
     - Hairballs
     - Focal intestinal neoplasia
     - Megacolon

History
   - Age (infectious diseases like panleukopenia are more common in young cats)?
   - Description of the vomit (hairball, houseplant, grass, blood)?
   - Diet changes, recent drug therapy, access to toxins?
   - Signs in other cats in the household?
   - Outdoor cat?
   - Vaccination status?
   - Other clinical signs suggest an underlying disease?

Physical examination
   - Abdominal palpation
   - Rectal temperature

Further diagnostics to consider
   - Thoracic radiographs when oesophageal disease is suspected
   - Abdominal radiography and/or ultrasonography when intestinal obstruction is suspected or abnormalities are found on abdominal palpation
   - Faecal examination for parasites, panleukopenia virus faecal test, serology for FeLV/FIV

History
   - Onset and progression of signs
   - Presence of diarrhoea
   - Appetite, nutritional status and weight loss
   - Fluid intake (increased, decreased or normal?)
   - Micturition behaviour, dysuria, anuria
   - Presence of abdominal pain

Physical examination
   - Dehydration, pale mucous membranes, hypothermia, tachycardia
   - Size of the bladder
   - Skin turgor

History
   - Vomiting or regurgitation (abdominal effort involved?)
   - Haematemesis
   - Timing related to eating
   - Presence of abdominal pain
   - Access to foreign bodies
   - Ptyalism and depression

Physical examination
   - Abdominal palpation
   - Oral examination (presence of foreign bodies, including under the tongue)
   - Inspection of anus (linear foreign bodies)
   - Abdominal distension/effusion
   - Dyspnea, tachypnea, auscultation

Further diagnostics
   - Suspicion of oesophageal disease, dyspnoea, tachypnoea or abnormal auscultation: thoracic radiographs
   - Abdominal pain, mass, thickened intestines: diagnostic imaging of the abdomen (ultrasonography, radiography, contrast radiography, endoscopy, exploratory coeliotomy, or laparoscopy), biopsies
1. Common causes of chronic vomiting

- Inflammatory bowel disease
- Adverse reactions to food
- Pancreatitis
- Liver disease
- Uraemia
- Constipation
- Neoplasia
- Hyperthyroidism

2. Many other causes to consider: Diagnostic approach

- No clear abnormality found: start with haematological examination, biochemistry profile and urinalysis
- Palpation of cervical area
- Abdominal palpation normal? Wait for lab results first
- Diagnostic imaging of abdomen to be considered in any vomiting cat, but especially if abnormalities found on palpation
- Dyspnoea, tachypnoea or abnormal auscultation? History of cardiac disease? Thoracic radiography and/or echocardiography

Acute or chronic (>3 weeks) vomiting?

- Onset and progression of signs
- Hematemesis
- Relationship to eating
- Presence of diarrhoea, haematochezia, melaena
- Appetite, nutritional status and weight loss
- Concurrent constipation or tenesmus

Physical examination

- Abdominal palpation
- Mucous membranes (icterus?)
- Abdominal distension/effusion
- Oral examination (uraemic ulcers?)

Further diagnostics to consider

- Haematology, clinical chemistry, urinalysis
- Dietary trial
- Ultrasonography with fine needle aspiration cytology of liver, biopsy and/or cholecystocentesis
- Endoscopy

Other diagnostic tests to be considered

- Elimination diet trial
- Other blood tests (TLI, PLI, folate, cobalamin, lactate, coagulation tests and total T4 measurement in cats >6 years)
- Serology (FeLV, FIV)
- Faecal examinations (flotation), panleukopenia test, Tritrichomonas tests
- Examination of the vomit (Ollulanus tricuspis)
- Examination of peritoneal or thoracic effusion
- Fine needle aspiration cytology of any abnormal organs or masses found
- Testing for heartworm in endemic areas
- Advanced imaging
- Endoscopy with biopsies
## Treatment & management of emesis

### Symptomatic treatment

**For cats that are systemically well or as supportive care pending the results of investigations**

- Fluid and electrolyte treatment
- Antiemetic treatment
  - NK<sub>1</sub> receptor antagonists (e.g. maropitant)
  - 5-HT<sub>3</sub> receptor antagonists (e.g. ondansetron)
  - D<sub>2</sub> antagonists (metoclopramide)
    - Questionable as central antiemetic in cats
    - Questionable as gastrointestinal prokinetic
- For motion sickness:
  - Maropitant effective
  - H<sub>1</sub> receptor blockers not effective

### Dietary management

**For acute gastrointestinal disorders**

- Withhold food for 24 hours
- Bowel can also be rested if a highly digestible diet is fed
- Continuing feeding may exacerbate vomiting or diarrhoea
- Food withholding? Take care in obese and sick cats!
- Thereafter: small quantities of a bland, highly digestible diet
  3–4 times per day

**For chronic gastrointestinal diseases**

- Diet based on novel ingredients
- Hydrolyzed protein diet

**Nutritional requirements of hospitalized cats**

- Withholding food not recommended
- Early enteral feeding (also in cats with severe pancreatitis)